191906

STATE OF SOUTH CAROLINA)

(Caption of Case))
Request for Implementing Forest Hills Phase 2 Rate Increase)

BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

COVER SHEET

DOCKET NUMBER: 2003 - 277 - S

S. C. PUBLIC SERVICE COMMISSION
RECEIVED
APR 14 2008

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Posted: O. Duke
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(Please type or print)

Submitted by:	Jacabb Utilities, LLC	**SC Bar Number:**	
Address:	210 W North Second Street	**Telephone:**	864-882-8194
	Seneca, SC 29678	**Fax:**	864-882-0851
		Other:	
		Email:	sheilat@goldieassociates.com

NOTE: The cover sheet and information contained herein neither replaces nor supplements the filing and service of pleadings or other papers as required by law. This form is required for use by the Public Service Commission of South Carolina for the purpose of docketing and must be filled out completely.

DOCKETING INFORMATION (Check all that apply)

☐ **Emergency Relief demanded in petition** ☒ **Request for item to be placed on Commission's Agenda expeditiously**

☐ **Other:**

INDUSTRY (Check one)

- ☐ Electric
- ☐ Electric/Gas
- ☐ Electric/Telecommunications
- ☐ Electric/Water
- ☐ Electric/Water/Telecom.
- ☐ Electric/Water/Sewer
- ☐ Gas
- ☐ Railroad
- ☒ Sewer
- ☐ Telecommunications
- ☐ Transportation
- ☐ Water
- ☐ Water/Sewer
- ☐ Administrative Matter
- ☐ Other:

NATURE OF ACTION (Check all that apply)

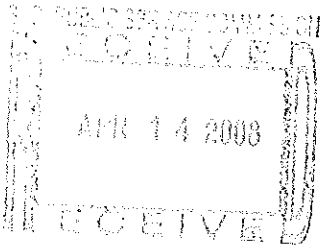
- ☐ Affidavit
- ☐ Agreement
- ☐ Answer
- ☐ Appellate Review
- ☐ Application
- ☐ Brief
- ☐ Certificate
- ☐ Comments
- ☐ Complaint
- ☐ Consent Order
- ☐ Discovery
- ☐ Exhibit
- ☐ Expedited Consideration
- ☐ Interconnection Agreement
- ☐ Interconnection Amendment
- ☐ Late-Filed Exhibit
- ☐ Letter
- ☐ Memorandum
- ☐ Motion
- ☐ Objection
- ☐ Petition
- ☐ Petition for Reconsideration
- ☐ Petition for Rulemaking
- ☐ Petition for Rule to Show Cause
- ☐ Petition to Intervene
- ☐ Petition to Intervene Out of Time
- ☐ Prefiled Testimony
- ☐ Promotion
- ☐ Proposed Order
- ☐ Protest
- ☐ Publisher's Affidavit
- ☒ Report
- ☐ Request
- ☐ Request for Certificatio
- ☐ Request for Investigatior
- ☐ Resale Agreement
- ☐ Resale Amendment
- ☐ Reservation Letter
- ☐ Response
- ☐ Response to Discovery
- ☐ Return to Petition
- ☐ Stipulation
- ☐ Subpoena
- ☐ Tariff
- ☐ Other:

BEFORE

THE PUBLIC SERVICE COMMISSION OF

SOUTH CAROLINA

DOCKET NO. 2003-277-S



IN RE:

Request for Implementing Forest Hills Phase 2 Rate Increase

CERTIFICATE OF SERVICE

This is to certify that I have caused to be served this day one (1) copy of the **Report** by placing same in the care and custody of the United States Postal Service with first class postage affixed thereto and addressed as follows:

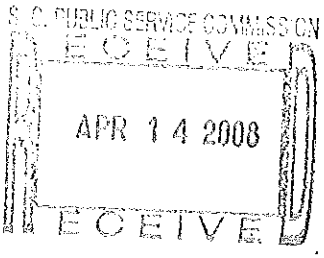
Dukes Scott
Office of Regulatory Staff
Post Office Box 11263
Columbia, SC 29211

Sheila J. Tinsley

Seneca, South Carolina
This 11 day of April 2008

JACABB UTILITIES, LLC

April 10, 2008



VIA – FIRST CLASS MAIL
Mr. Charles Terreni
Chief Clerk of the Commission
SC Public Service Commission
P.O. Box 11649
Columbia, SC 29211

RE: Request for Implementing Forest Hills Phase 2 Rate Increase
Docket 2003-277-S – Order No. 2004-101

Dear Mr. Terreni:

Jacabb Utilities, LLC requests the South Carolina Public Service Commission (Commission) approve the rate increase for the Phase 2 rate structure and concur with the tie-in to the Town of Williamston's Big Creek East Wastewater Treatment Plant under Docket 2003-277-S - Order No, 2004-101. This docket is listed in the name of J.C. Cox Utilities, Inc. however the transfer of sewer services, assets, and authority from J.C. Cox Utilities to Jacabb Utilities, LLC was approved under Docket No. 2005-43-S - Order 2005-617.

In order to comply with the above referenced order, Jacabb Utilities submits the following report.

October 2006 a PER was submitted to DHEC for upgrades to the Forest Hills Wastewater Treatment Plant in order to be in compliance with Consent Order 06-128W, Attachment A. On January 17, 2007 a response was received from DHEC, Attachment B, with a new wasteload allocation for the Forest Hills Subdivision. The costs to meet the unaccepted new limits would have been enormous and not practical for the number of customers. Jacabb Utilities re-submitted requests to Anderson County and Town of Williamston for permission to use a portion of Anderson County's capacity in the Big Creek WWTP, Attachments C and D. In August 2007 we received approval from Anderson County to utilize 32,000 gallons per day of Anderson County capacity in the Town of Williamston's Big Creek East Wastewater Treatment Plant, Attachment E. The Town of Williamston approval letter was sent to Anderson County on April 20, 2007, Attachment F.

On May 31, 2007 a construction application package for the Forest Hills Subdivision Lift Station was submitted to DHEC, Attachment G. A Wastewater Construction Permit was received from DHEC on October 4, 2007, Attachment H. A revised sewer submittal was sent to DHEC on January 8, 2008, Attachment I and a revised Wastewater Construction Permit was issued, Attachment J.

According to Consent Order 06-128W, all construction and a request for an approval to operate from DHEC must be completed by June 7, 2008. Jacabb Utilities is committed to

210 W.N. Second Street · Seneca · SC · 29678 · phone · 864-882-8194 · fax · 864-882-0851

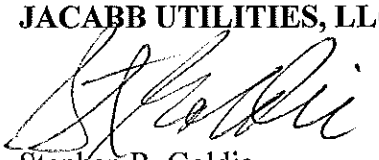
meeting this schedule and respectfully requests that the Commission act expeditiously in reviewing and approving this request.

Jacabb Utilities hereby requests the South Carolina Public Service Commission concur with the construction of the lift station for the tie-in with the Town of Williamston's Big Creek East Wastewater Treatment Plant using Anderson County's capacity. Jacabb Utilities also requests the Commission to authorize the implementation of Phase 2 rates as approved by Docket No. 2003-277-S Order No. 2004-101.

Please do not hesitate to contact me if you have any questions or if I may provide you with additional information. Thank you in advance for your assistance.

Sincerely,

JACABB UTILITIES, LLC



Stephen R. Goldie
Managing Member

Enclosures

cc: Scott Dukes, Office of Regulatory Staff
James S. Eakes, Esquire

ATTACHMENT A

BOARD:
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Chairman

Edwin H. Cooper, III
Vice Chairman

Steven G. Kisner
Secretary

D H E C

PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment.

BOARD:
Henry C. Scott
Paul C. Aughtry, III
Glenn A. McCall
Coleman F. Buckhouse, MD

RECEIVED
JUL 28 06
2:53P

July 27, 2006

Certified Mail – 7005 0390 0001 4013 8490
Return Receipt Requested

Mr. Steve Goldie
Managing Owner
JACABB Utilities, LLC
210 West North Second Street
Seneca, SC 29678

Re: Consent Order **06-128-W**
Forest Hills SD WWTF
NPDES Permit SC0028525
Anderson County

Dear Mr. Goldie:

Enclosed, please find fully executed Consent Order 06-128-W. The Order is considered executed on July 25, 2006.

If you have any questions, or would like to discuss this matter further, please call me at (803) 898-4273. I will be happy to assist you.

Sincerely,

Robert L. Proctor
Water Enforcement Division
Bureau of Water

cc: Jaime Teraoka, WP Enforcement/Compliance Section
Jon Batson, Region I-Anderson EQC Office
Mike Montebello, BOW-Domestic Wastewater Permitting

evaluation (DE) and if required by the DE, submit a preliminary engineering report (PER) with schedule to the Department to upgrade its WWTF.

3. On October 20, 2004, Mr. Scott Elliott, Attorney for J.C. Cox Utility Inc., submitted the CAP required under Consent Order 02-142-W AMD. The CAP proposed that J.C. Cox Utility would sell the WWTF within one hundred eighty (180) days to someone capable of properly operating and maintaining the system.

4. On January 4, 2006, the Respondent purchased the WWTF from J.C. Cox Utility, Inc. and notified the Department of the final closing on the property.

5. On January 25, 2006, Department staff approved the ownership transfer and issued National Pollutant Discharge Elimination System (NPDES) Permit SC0028525 authorizing the Respondent to discharge treated wastewater to a tributary of the Saluda River in accordance with the effluent limitations, monitoring requirements and other permit conditions.

6. On May 19, 2006, Department staff met with Mr. Steve Goldie, managing owner, acting as agent for the Respondent, to discuss the Respondent's obligations and the possible upgrades to the WWTF. The parties discussed the issuance of this Order to include the assessment of stipulated civil penalties as outlined below.

WHEN THIS ORDER IS FINALLY EFFECTIVE, IT SUPERSEDES AND REVOKES CONSENT ORDER 02-142-W, dated July 12, 2002, and Consent Order 02-142-W AMD, dated June 15, 2004, in accordance with S.C. Code Ann. § 48-1-50(3) (1987).

CONCLUSIONS OF LAW

Based upon the above Findings of Fact, the Department reaches the following Conclusions of Law:

THE PARTIES FURTHER STIPULATE that the Respondent shall pay to the Department stipulated civil penalties in the amount of five thousand dollars ($5,000.00) if the Respondent fails to meet any schedule date, plus five thousand dollars ($5,000.00) per month for each and every additional month the Respondent fails to meet that schedule date, unless the schedule date has been extended by mutual agreement through the amendment of this Consent Order. For example, if the schedule requires a PER to be submitted by November 1, 2006, and the Respondent submits the PER on December 1, 2006, the Respondent will pay a civil penalty of $5,000 for failing to meet the schedule date and an additional $10,000 for the additional two months failure to meet the schedule date.

All penalties due under this paragraph shall be made payable to the South Carolina Department of Health and Environmental Control.

All penalties, including those due and payable in the event of the Respondent's failure to comply with this Order, shall be in addition to any other remedies or sanctions which may be available to the Department by reason of the Respondent's failure to comply with the requirements of this Order.

THE PARTIES FURTHER STIPULATE that should the Respondent fail to complete the upgrades required, by this Order, to meet the effluent limits of the NPDES Permit or comply with the compliance schedule of this Order, the Respondent shall pay to the Department stipulated civil penalties in the amount of one thousand dollars ($1,000.00) per violation of the effluent discharge limits as contained in the NPDES Permit until such time as the upgrades are approved for operation, by the Department.

All penalties due under this paragraph shall be made payable to the South Carolina

of any of the conditions under this Consent Order including, but not limited to: a) acts of God, fire, war, insurrection, civil disturbance, explosion; b) adverse weather condition that could not be reasonably anticipated causing unusual delay in transportation and/or field work activities, c) restraint by court order or order of public authority; d) inability to obtain, after exercise of reasonable diligence and timely submittal of all applicable applications, any necessary authorizations, approvals, permits, or licenses due to action or inaction of any governmental agency or authority; and e) delays caused by compliance with applicable statutes or regulations governing contracting, procurement or acquisition procedures, despite the exercise of reasonable diligence by the Respondent.

Events which are not *force majeure* include by example, but are not limited to, unanticipated or increase costs of performance, changed economic circumstances, normal precipitation events, or any person's failure to exercise due diligence in obtaining governmental permits of fulfilling contractual duties. Such determination will be made in the sole discretion of the Department. Any extension shall be incorporated by reference as an enforceable part of this Amended Consent Order and thereafter be referred to as an attachment to the Amended Consent Order.

IT IS FURTHER ORDERED AND AGREED that failure to comply with any provision of this Amended Order shall be grounds for appropriate sanctions and further enforcement action pursuant to the Pollution Control Act, S.C. Code Ann. § 48-1-330 (1987), to include the assessment of additional civil penalties.

IT IS FURTHER ORDERED AND AGREED that this Consent Order governs only Jacabb Utilities, LLC's liability to the Department for civil sanctions arising from the matters set forth herein and constitutes the entire agreement between the Department and Jacabb Utilities, LLC with respect to the resolution and settlement of the matters set forth herein. The parties are not relying

GOLDIE
&
ASSOCIATES
engineering, environmental and laboratory services

January 15, 2007

Mr. Lee Proctor
Enforcement Section, Bureau of Water
SC DHEC
2600 Bull Street
Columbia, SC 29201-1708

Re: Consent Order # 06-128-W
Forest Hills SD WWTP (NPDES SC0028525)
Williamston, Anderson County, SC
G&A Project #1001.11.4

Dear Mr. Proctor,

In accordance with the above-referenced compliance schedule we submitted a PER for approval to Mr. Mike Montebello's office on October 31, 2006. Ms. Brenda Green of his group is handling the project. We are to submit plans and specifications for the project by March 7, 2007, but have yet to hear a response from the PER.

In order to allow time to incorporate their comments (which we hope to receive soon) and complete the design, we are requesting a 60 day extension to May 7, 2007 in order to meet this deadline.

If you have any questions or need additional information, please let us know.

Sincerely,

Goldie & Associates

Paul Lewis, P.E.
Project Manager

Cc: Ms. Brenda Green, Domestic WW Permitting (copy by email)
Mr. Mike Montebello, Domestic WW Permitting (copy by email)
Mr. Henry Dyar, Jacabb Utilities (copy by email)

210 W. North Second Street • Seneca, South Carolina 29678 • Phone (864) 882-8194 • Fax (864) 882-0851

BOARD:
Elizabeth M. Hagood
Chairman

Edwin H. Cooper, III
Vice Chairman

L. Michael Blackmon
Secretary

D H E C

PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment.

BOARD:
Carl L. Brazell

Steven G. Kisner

Paul C. Aughtry, III

Coleman F. Buckhouse, MD

January 16, 2007

Certified Mail – 7005 2570 0001 5175 9743
Return Receipt Requested

RECEIVED 1/18/07

Mr. Steve Goldie
Managing Owner
JACABB Utilities, LLC
210 West North Second Street
Seneca, SC 29678

RE: Consent Order 06-128-W
Forest Hills SD WWTF
NPDES Permit SC0028525
Anderson County

Dear Mr. Goldie:

This letter is in follow-up to Mr. Paul Lewis's letter dated January 15, 2007. Based on the information included in Mr. Lewis's letter, the compliance schedule of Consent Order 06-128-W has been amended as follows:

a) May 1, 2007 – Submit plans, specifications, and an administratively and technically complete application for a permit to construct the necessary upgrades.

b) Thirty (30) days from awarding a contract for the construction of the necessary upgrades, begin construction activities at the Site.

If you have any questions concerning this matter or I can be of further assistance, please feel free to contact me at (803) 898-4273 or by email at proctorl@dhec.sc.gov.

Sincerely,

Robert L. Proctor

Robert L. "Lee" Proctor
WP Enforcement Section
Water Enforcement Division

cc: Jaime Teraoka, WP Enforcement Section
Mike Montebello, BOW-Domestic Wastewater Permitting
Jon Batson, Region I-Anderson EQC Office

ATTACHMENT B

BOARD:
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Vice Chairman
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D H E C

PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment

January 17, 2007

Mr. Paul Lewis, P.E.
Goldie & Associates, Inc.
210 W. North Second St.
Seneca, SC 29678

RE: Forest Hills Subdivision – Preliminary Engineering Report (PER)
NPDES Permit No. SC0028525
Anderson County

Dear Mr. Lewis:

At your request within your revised PER dated October 2006, a wasteload allocation has been obtained for Forest Hills Subdivision at the proposed flows of 0.018 MGD and 0.026 MGD. This wasteload information will replace or supersede all previous wasteload information provided based on new information presented by the Water Quality Modeling Section.

Based on the wasteload allocation, the NPDES limits can be expected to be as follows (these are generally monthly average values unless noted, additional limits with weekly average and daily maximum concentrations may also be included):

Parameter	Limit	
Flow - MGD	0.018	0.026
BOD_5 - mg/l	30	30
TSS - mg/l	30	30
NH_3-N - mg/l	3.6	3.2
TRC (monthly average) - mg/l	0.017	0.015
TRC (daily maximum) - mg/l	0.030	0.026
Dissolved Oxygen (D.O.) - mg/l	4.0	4.0
Fecal Coliform (/100 ml)	200	200
Total Cadmium (Monthly average /Daily Maximum)	0.0005 mg/l /0.0031 mg/l	0.0005 mg/l /0.0027 mg/l
Total Copper (Monthly average /Daily Maximum)	0.014 mg/l / 0.018 mg/l	0.013 mg/l / 0.017 mg/l
Total Lead (Monthly average /Daily Maximum)	0.004 mg/l / 0.097 mg/l	0.003 mg/l / 0.093 mg/l

The following conditions should be noted. The wasteload is informational only until the following actions occur:

1. A determination whether the project is consistent with the applicable 208 Water

S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
BUREAU OF WATER
DIVISION OF WATER QUALITY
WATER QUALITY MODELING SECTION

WASTELOAD ALLOCATION WORKSHEET AND COORDINATION FORM

Date: 12/11/06 Engineer: Green WLA #: ----
Discharger: Forest Hills SD NPDES: SC0028525
County: Anderson Basin: 0201 HUC: 030501090307
Receiving waters: Unnamed Trib to Saluda River On 303 (d) list? no

I. Water Quality Modeling Section

A. Model Data:

Model used: Qual2e

Name: utsal018.in/out

USGS station / site: 021629998/308

Unit 7Q10 (cfs/mi^2): 0.07

Stream 7Q10 (cfs): 0.0156

Avg. annual flow (cfs): 0.33

Drainage area (mi^2): 0.223

Stream Q: waste Q ratio: 0.39

Temp critical (F/C): 75.2/24

Temp seasonal (F/C): 55.4/13

Velocity (ft/s): 0.22

Slope (ft/mi): 99

K1 (d^{-1}): 0.6

K2 (d^{-1}): 10

K3 (d^{-1}): 0.5

F ratio: 1.5

Stream characteristics: _____

B. Model Input Sources

Waters in question? no Literature: Agreement
Similar waters: _____
Field data available? none
Describe field data: _____

II. Engineering Section

A. Do the model outputs exceed established technological limits for this type of wastewater? Yes - No If yes, explain below in the space provided.

B. Are there factors which make the model outputs inconsistent with best engineering judgment and/or federal effluent guidelines? Yes - No. If yes, explain below in the space provided.

C. Are there other factors which would make the WLA either more stringent or less stringent? Yes - No. If yes, explain below in the space provided.

D. Are there factors that make the water quality model outputs impractical or un-implementable at this time? Yes - No. If yes, explain below in the space provided.

E. Recommended limits

Flow: _____

BOD5 critical: _____ BOD5 seasonal: _____

NH3-N critical: _____ NH3-N seasonal: _____

UOD critical: _____ UOD seasonal: _____

Effluent DO: _____

Phosphorus: _____

Other parameters: _____

Engineering comments: _____

F. Is there agreement with water quality model outputs? Yes No

Engineer: _____

Date: _____

SCDHEC Ammonia Toxicity Calculation

Based on 1999 EPA Water Quality Criteria for Ammonia as adopted by S.C. DHEC R.61-68

Division of Water Quality

July 29, 2004

Discharger Name:	Forest Hill SD
Receiving Stream:	Unnamed Trib to Saluda River
Date:	12/11/06
Analyst:	WMC

Input Data

Upstream Flow (cfs):	0.0156
Upstream Total Ammonia Concentration (mg N/L):	0.11
Stream Temperature, critical (deg. C):	24
Stream Temperature, seasonal (deg. C):	13
Stream pH:	7.5
Discharge Flow (mgd):	0.026
Are Salmonids Present? (yes/no):	no
Are Fish ELS Present? (yes/no):	yes

Instream Total Ammonia Toxicity Results

Period:	*Critical*	*Seasonal*
Criterion Maximum Concentration, CMC (mg N/L):	19.890	19.890
Criterion Continuous Concentration, CCC (mg N/L):	2.368	4.364

Discharge Total Ammonia Results

Period:	*Critical*	*Seasonal*
Max. Conc. Protecting Against Acute Toxicity (mg N/L):	27.56	27.56
Max. Conc. Protecting Against Chronic Toxicity (mg N/L):	3.24	6.01

Facility Information:	
Name of Facility:	Forest Hills SD
NPDES Number:	SC0028525
Is this discharge above Drinking Water Plant Intake:	Yes — Intake#: S04 TO S

Effluent Information:

Plant Flow (mgd) :	0.026
Effluent TSS (mg/l) :	30
Effluent Hardness (mg/l $CaCO_3$):	25

Receiving Water Information at the WWTP Discharge Point:

Name of Receiving Waters:	unnamed tributary to Saluda River
Water Classification:	FW
7Q10 at discharge point (cfs) :	0.016
Average Annual Flow at discharge point (cfs):	0.330

Receiving Water Information for protection of SWPA if applicable:

Name of Receiving Waters:	Saluda River
Water Classification:	FW
7Q10 at SWPA Boundary (cfs):	92.000
AAF at SWPA Boundary (cfs):	626.000

Stream TSS (mg/l) :	1	pH (Mix)	7.8
Stream Hardness (mg/l $CaCO_3$)	25		

Default Stream TSS = 1 mg/l
Default Hardness = 25 mg/l

This Discharge IS upstream of a proposed or exisiting water plant intake

Applicable Steam Flows

For Protection of Aquatic Life (AL) and Organoleptic Effects (OL) at Discharge Point:

7Q10 at Discharge Point (cfs):	0.016	% of 7Q10 @ WWTPavailable for mixing (%):	100
AAF at Discharge Point (cfs):	0.330	% of AAF @ WWTP available for mixing (%):	100

For Protection of Human Health (Org) at Discharge Point:

7Q10 at Discharge Point (cfs):	0.016	% of 7Q10 @ WWTPavailable for mixing (%):	100
AAF at Discharge Point (cfs):	0.330	% of AAF @ WWTP available for mixing (%):	100

For Protection of Human Health (W/O and MCL):

7Q10 at SWPA Boundary (cfs):	92.000	% of 7Q10 available for mixing (%):	100
AAF at SWPA Boundary (cfs):	626.000	% of AAF available for mixing (%):	100

Updated
March 13, 2006

Parameter	SS Method	SS-CCC (ug/l)	SS-CMC (ug/l)	WER
Arsenic	N/A			
Cadmium	N/A			
Chromium+3	N/A			
Chromium+6	N/A			
Copper	N/A			
Lead	N/A			
Mercury	N/A			
Nickel	N/A			
Zinc	N/A			
Silver	N/A			

This information is used only for headworks analysis

Treatment Process:	
Primary	No
Activated Sludge	No
Trickling Filter	No
Nitrification (Tertiary)	No
Anaerobic Digestion	No

Sludge - Land Application:	
Class-A	No
Class-B	No

Applicable Effluent Limits:	FW

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Name of Facility:		Forest Hills SD			DF1	For AL at discharge pt. (7Q10)			1.3870968			DF3	For W/O & MCL at SWPA boundary (7Q10)			Updated June 24, 2004	2283.88	
2	NPDES Number:		SC0028525			DF2	For OL at discharge pt. (AAF)			9.1885856			DF4	For W/O & MCL at SWPA boundary (AAF)				1553.45	
3	Receiving Water:		unnamed tributary to Saluda River			DF1	For HH-Org at discharge pt. (7Q10)			1.387097									
4	Water Classification:		FW			DF2	For HH-Org discharge pt. (AAF)			9.188586									
5	Flow (mgd):		0.026																
6	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
7				Derived Limits (mg/l)		Data for Reasonable Potential Analysis								Receiving Water		Reasonable Potential		Governing Criteria	
8		Parameter	PQL	Fresh Water		Average		Maximum		For Average		For Maximum		Concentration		Yes/No		Fresh Water	
9			(mg/l)	Avg (mg/l)	Max (mg/l)	Avg (mg/l)	# of samp	Max (mg/l)	# of sam	CV	M. Factor	CV	M. Factor	RWC		Avg.	Max	Avg	Max
10		Metals, Cyanide, Phenols		For All	AL Only		n		n	for RP	for RP	for RP	for RP	Avg (mg/l)	Max (mg/l)	ALL	AL(Only)		
11		Antimony	0.0050	3.745E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
12		Arsenic, total	0.0050	1.286E-03	9.948E-01	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
13		Beryllium	0.0010	2.228E-03	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
14		Cadmium, total	0.00010	4.925E-04	2.705E-03	0.00084	11	0.00084	11	2.08	3.30	2.08	3.30	2.772E-03	2.772E-03	Yes	Yes	AL	AL
15		Chromium, total	0.0050	2.284E+02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
16		Copper, total	0.010	1.272E-02	1.567E-02	0.01	11	0.01	11	3.32	4.40	3.32	4.40	4.400E-02	4.400E-02	Yes	Yes	AL	AL
17		Lead	0.0020	3.592E-03	9.313E-02	0.0046	11	0.0046	11	1.92	3.20	1.92	3.20	1.472E-02	1.472E-02	Yes	No	AL	
18		Mercury	0.00000050	7.074E-05	5.499E-03	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
19		Nickel	0.010	6.277E-02	5.891E-01	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
20		Selenium	0.0050	5.935E-03	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
21		Silver, total	0.0050	-	2.535E-04	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
22		Thallium	0.0005	8.739E-03	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
23		Zinc, total	0.010	3.606E+01	2.067E-01	0.05	11	0.05	11	0.98	2.20	0.98	2.20	1.100E-01	1.100E-01	No	No		
24		Cyanide, total	0.010	7.213E-03	3.052E-02	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
25		Phenols, total	0.0050			0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
26																			
27		Volatile Organic Compounds																	
28		Acrolein	0.0050	2.858E-03	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
29		Acrylonitrile	0.0050	2.297E-03	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
30		Benzene	0.0020	2.219E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
31		Bromoform	0.0020	1.235E+00	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
32		Carbon Tetrachloride	0.0020	1.470E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
33		Chlorobenzene	0.0020	1.051E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
34		Chlorodibromomethane	0.0020	1.195E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
35		Chloroethane	0.0020																
36		2-Chloroethyl vinyl ether	0.0050	9.987E+00	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
37		Chloroform	0.0020	5.271E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
38		Dichlorobromomethane	0.0020	1.562E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
39		1,1-Dichloroethane	0.0020	8.461E+00	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
40		1,2-Dichloroethane	0.0020	3.400E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
41		1,2-trans-Dichloroethylene	0.0020	4.855E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
42		1,1-Dichloroethylene	0.0020	2.940E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
43		1,2-Dichloropropane	0.0020	1.378E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
44		1,3-Dichloropropylene	0.0020	2.522E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
45		Ethylbenzene	0.0020	1.345E+00	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
46		Methyl bromide	0.0020	4.577E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
47		Methyl chloride	0.0020	4.577E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
48		Methylene chloride	0.0020	4.577E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
49		1,1,2,2-Tetrachloroethane	0.0020	3.675E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
50		Tetrachloroethylene	0.0020	3.032E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
51		Toluene	0.0020	7.356E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
52		1,1,1-Trichloroethane	0.0020	7.629E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
53		1,1,2-Trichloroethane	0.0020	1.470E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
54		Trichloroethylene	0.0020	2.757E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
55		Vinyl chloride	0.0020	4.870E+00	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
56																			
57		Acid-Extractable Compounds																	

SCDHEC Total Residual Chlorine (TRC) Calculator
Based on 1986 EPA Water Quality Criteria
Water Facilities Permitting Division
March 2001

Discharger Name:	Forest Hills SD
NPDES Number:	SC0028525
Receiving Stream:	unnamed tributary to Saluda River
Reciving Water Classification:	FW

Input Data	
7Q10 (cfs):	0.02
Background Chlorine Concentration (mg/l):	0.00
Discharge Flow (mgd):	0.03
Instream Criteria Due to Toxicity (EPA 1986)	
Criterion Monthly Average Concentration (mg/l):	0.011
Criterion Daily Maximum Concentration (mg/l):	0.019
Discharge Total Residual Chlorine (TRC) Results	
Monthy Average Effluent Concentration (mg/l):	0.015
Daily Maximum Effluent Concentration (mg/l):	0.026

Facility Information:

Name of Facility:	Forest Hills SD
NPDES Number:	SC0028525
Is this discharge above Drinking Water Plant Intake:	Yes — Intake#: S04105

Effluent Information:

Plant Flow (mgd) :	0.018
Effluent TSS (mg/l) :	30
Effluent Hardness (mg/l $CaCO_3$):	25

Receiving Water Information at the WWTP Discharge Point:

Name of Receiving Waters:	unnamed tributary to Saluda River
Water Classification:	FW
7Q10 at discharge point (cfs) :	0.016
Average Annual Flow at discharge point (cfs):	0.330

Receiving Water Information for protection of SWPA if applicable:

Name of Receiving Waters:	Saluda River
Water Classification:	FW
7Q10 at SWPA Boundary (cfs):	92.000
AAF at SWPA Boundary (cfs):	626.000

Stream TSS (mg/l) :	1
Stream Hardness (mg/l $CaCO_3$)	25

pH (Mix)	7.8

Default Stream TSS = 1 mg/l

Default Hardness = 25 mg/l

This Discharge IS upstream of a proposed or exisiting water plant intake

Applicable Steam Flows

For Protection of Aquatic Life (AL) and Organoleptic Effects (OL) at Discharge Point:

7Q10 at Discharge Point (cfs):	0.016	% of 7Q10 @ WWTPavailable for mixing (%):	100
AAF at Discharge Point (cfs):	0.330	% of AAF @ WWTP available for mixing (%):	100

For Protection of Human Health (Org) at Discharge Point:

7Q10 at Discharge Point (cfs):	0.016	% of 7Q10 @ WWTPavailable for mixing (%):	100
AAF at Discharge Point (cfs):	0.330	% of AAF @ WWTP available for mixing (%):	100

For Protection of Human Health (W/O and MCL):

7Q10 at SWPA Boundary (cfs):	92.000	% of 7Q10 available for mixing (%):	100
AAF at SWPA Boundary (cfs):	626.000	% of AAF available for mixing (%):	100

Updated
March 13, 2006

Parameter	SS Method	SS CCC (ug/l)	SS CMC (up/l)	WER
Arsenic	N/A			
Cadmium	N/A			
Chromium+3	N/A			
Chromium+6	N/A			
Copper	N/A			
Lead	N/A			
Mercury	N/A			
Nickel	N/A			
Zinc	N/A			
Silver	N/A			

This information is used only for headworks analysis

Treatment Process:

Primary	No
Activated Sludge	No
Trickling Filter	No
Nitrification (Tertiary)	No
Anaerobic Digestion	No

Sludge - Land Application:

Class-A	No
Class-B	No

Applicable Effluent Limits:	FW

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Name of Facility:		Forest Hills SD			DF1	For AL at discharge pt. (7Q10)			1.5591398			DF3	For WO & MCL at SWPA boundary (7Q10)			Updated June 24, 2004	3298.49	
2	NPDES Number:		SC0026525			DF2	For OL at discharge pt. (AAF)			12.827957			DF4	For WO & MCL at SWPA boundary (AAF)				22438.3	
3	Receiving Water:		unnamed tributary to Saluda River			DF1	For HH-Org at discharge pt. (7Q10)			1.559140									
4	Water Classification:		FW			DF2	For HH-Org discharge pt. (AAF)			12.827957									
5	Flow (mgd):		0.018																
6	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
7				Derived Limits (mg/l)		Data for Reasonable Potential Analysis								Receiving Water		Reasonable Potential		Governing Criteria	
8		Parameter	PQL	Fresh Water		Average		Maximum		For Average		For Maximum		Concentration		Yes/No		Fresh Water	
9			(mg/l)	Avg (mg/l)	Max (mg/l)	Avg (mg/l)	# of samp	Max (mg/l)	# of sam	CV	M. Factor	CV	M. Factor	RWC		Avg.	Max	Avg	Max
10		Metals, Cyanide & Phenols		For All	AL Only		n		n	for RP	for RP	for RP	for RP	Avg (mg/l)	Max (mg/l)	ALL	AL(Only)		
11		Antimony	0.0050	4.210E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
12		Arsenic, total	0.0050	1.796E-03	1.101E+00	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
13		Beryllium	0.0010	2.504E-03	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
14		Cadmium, total	0.00010	5.595E-04	3.073E-03	0.00084	11	0.00084	11	2.08	3.30	2.08	3.30	2.772E-03	2.772E-03	Yes	No	AL	
15		Chromium, total	0.0050	3.298E+02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
16		Copper, total	0.010	1.402E-02	1.837E-02	0.01	11	0.01	11	3.32	4.40	3.32	4.40	4.400E-02	4.400E-02	Yes	Yes	AL	AL
17		Lead	0.0020	3.760E-03	9.749E-02	0.0046	11	0.0046	11	1.92	3.20	1.92	3.20	1.472E-02	1.472E-02	Yes	No	AL	
18		Mercury	0.00000050	7.952E-05	6.242E-03	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
19		Nickel	0.010	6.843E-02	6.422E-01	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
20		Selenium	0.0050	7.796E-03	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
21		Silver, total	0.0050		2.962E-04	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
22		Thallium	0.0005	9.823E-03	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
23		Zinc, total	0.010	4.054E-01	2.267E-01	0.05	11	0.05	11	0.98	2.20	0.98	2.20	1.100E-01	1.100E-01	No	No		
24		Cyanide, total	0.010	8.108E-03	3.430E-02	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
25		Phenols, total	0.0050			0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
26																			
27		Volatile Organic Compounds																	
28		Acrolein	0.0050	3.213E-03	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
29		Acrylonitrile	0.0050	3.207E-03	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
30		Benzene	0.0020	2.495E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
31		Bromoform	0.0020	1.388E+00	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
32		Carbon Tetrachloride	0.0020	2.052E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
33		Chlorobenzene	0.0020	1.181E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
34		Chlorodibromomethane	0.0020	1.668E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
35		Chloroethane	0.0020																
36		2-Chloroethyl vinyl ether	0.0050	1.123E+01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
37		Chloroform	0.0020	5.925E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
38		Dichlorobromomethane	0.0020	2.181E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
39		1,1-Dichloroethane	0.0020	9.511E+00	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
40		1,2-Dichloroethane	0.0020	4.746E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
41		1,2-trans-Dichloroethylene	0.0020	5.457E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
42		1,1-Dichloroethylene	0.0020	4.105E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
43		1,2-Dichloropropane	0.0020	1.924E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
44		1,3-Dichloropropylene	0.0020	2.835E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
45		Ethylbenzene	0.0020	1.512E+00	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
46		Methyl bromide	0.0020	5.145E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
47		Methyl chloride	0.0020	5.145E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
48		Methylene chloride	0.0020	5.145E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
49		1,1,2,2-Tetrachloroethane	0.0020	5.131E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
50		Tetrachloroethylene	0.0020	4.233E-02	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
51		Toluene	0.0020	8.268E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
52		1,1,1-Trichloroethane	0.0020	8.575E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
53		1,1,2-Trichloroethane	0.0020	2.052E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
54		Trichloroethylene	0.0020	3.848E-01	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
55		Vinyl chloride	0.0020	6.799E+00	-	0	0	0	0	0.60	N/A	0.60	N/A	No Data	No Data				
56																			
57		Acid-Extractable Compounds																	

SCDHEC Total Residual Chlorine (TRC) Calculator
Based on 1986 EPA Water Quality Criteria
Water Facilities Permitting Division
March 2001

Discharger Name:	Forest Hills SD
NPDES Number:	SC0028525
Receiving Stream:	unnamed tributary to Saluda River
Reciving Water Classification:	FW

Input Data	
7Q10 (cfs):	0.02
Background Chlorine Concentration (mg/l):	0.00
Discharge Flow (mgd):	0.02
Instream Criteria Due to Toxicity (EPA 1986)	
Criterion Monthly Average Concentration (mg/l):	0.011
Criterion Daily Maximum Concentration (mg/l):	0.019
Discharge Total Residual Chlorine (TRC) Results	
Monthy Average Effluent Concentration (mg/l):	0.017
Daily Maximum Effluent Concentration (mg/l):	0.030

ATTACHMENT C

JACABB UTILITIES, LLC

March 21, 2007

Mr. Dewey Pearson
Anderson Co. Environmental Ser.
731 Michelin Blvd.
Anderson, SC 29626

RE: Forest Hills Subdivision Wastewater Treatment Plant
G&A Project 1001.11.4

Dear Mr. Pearson,

Jacabb Utilities has acquired the Forest Hills SD lagoon wastewater treatment plant (WWTP) and customers near the Town of Williamston from J.C. Cox Utilities. Due to tightening discharge limits, we desire to eliminate the lagoons and discharge into the Williamston Big Creek WWTP, in which Anderson County owns flow capacity. The Forest Hills SD system has only 34 customers, and the WWTP upgrades necessary to meet these discharge limits would cost hundreds of thousands of dollars, which would have to be borne by these few residents.

Based on the developed and undeveloped lots there, the maximum flow would be 32,000 gallons per day (gpd). Would the County be amenable to Forest Hills using a portion of the County's capacity in the Big Creek WWTP for these citizens? Enclosed please find our proposal to the Town for tying onto its system. Please let us know what charges, if any, would be associated with the use of this capacity.

Please contact our office if you have any questions.

Sincerely,

Jacabb Utilities, LLC

Stephen R. Goldie
Managing Owner

Enclosure

cc: Mayor Phillip Clardy, Town of Williamston

210 W.N. Second Street · Seneca · SC · 29678 · phone · 864-882-8194 · fax · 864-882-0851

ATTACHMENT D

GOLDIE & ASSOCIATES
engineering, environmental and laboratory services

February 28, 2007

Town of Williamston
PO Box 70
Williamston, SC 29697

ATTN: Mayor Phillip Clardy
Mr. Carthel Crout
Mr. David Harvell
Mr. Marion Middleton Jr.
Mr. Otis Scott

RE: Forest Hills Subdivision Wastewater Treatment Plant

Dear Sirs:

Within the past year our sister company, Jacabb Utilities, LLC, has acquired the Forest Hills Subdivision (SD) Wastewater Treatment Plant (WWTP), which serves 34 nearby residences and has potential for an additional 47 residences.

Due to tightening DHEC restrictions, we are facing major expensive upgrades to this system. The system is located near a manhole that is part of the Town of Williamston's sewer system. As you are aware, this subdivision is located in the county and not in the Town. If Anderson County agrees to allow this flow to be taken from their portion of the flow into the Town's WWTP, would you consider accepting the 32,000 gallons per day (gpd) flow from this neighborhood?

Obviously we would pay for the necessary sewage pump station, flow meter, pipe and appurtenances to do this. Jacabb Utilties would retain ownership of the facilities so there would be no maintenance cost or responsibility to the Town.

Enclosed please find a Preliminary Engineering Report that presents the information relevant to this project. We appreciate your consideration and look forward to discussing this with you in the near future.

We have requested to be put on the Town Council agenda for the March 19th meeting to discuss this with you. If you have any questions, please call me at (864) 882-8194 extension 106.

210 W. North Second Street • Seneca, South Carolina 29678 • Phone (864) 882-8194 • Fax (864) 882-0851

Sincerely,

GOLDIE AND ASSOCIATES

Paul Lewis

Paul Lewis, PE
Project Engineer

Enclosure

cc: Tim Hood
David Rogers

Preliminary Engineering Report
Forest Hills Subdivision Pump Station

Prepared For

Jacabb Utilities
210 W. North Second Street
Seneca, SC 29678

February 2007

Prepared By

Goldie & Associates
210 W. North Second Street
Seneca, SC 29678
(864) 882-8194

Goldie & Associates Project # 1001.11.4

Purpose

Forest Hills Subdivision is a residential community of approximately 100 lots, 34 of which have existing homes located near Williamston, SC. The wastewater treatment system for the Subdivision consists of a series of sewage collection lines leading into an aerobic wastewater treatment lagoon. Upgrades to the facility to treat for ammonia-nitrogen, total residual chlorine, cadmium, copper and lead are necessary in order to bring the system into compliance with SC DHEC standards. Due to the limited number of paying users, the sewer system cannot be feasibly operated and maintained at a reasonable user fee. The owner of the system, Jacabb Utilities (a sister company of Goldie & Associates), therefore desires to discharge to the Town of Williamston sewer system. .

The purpose of this Preliminary Engineering Report (PER) is to provide information to the Town of Williamston as a precursor to discussions regarding the future of sewer service to this area and these homeowners.

Only two alternatives are feasible for management of the Forest Hills wastewater system:

1. Jacabb Utilities can upgrade its existing lagoon facilities.
2. Jacabb Utilities can install and own a pump station to pump sewage to the City of Williamston as part of the Anderson County's portion of Williamston's WWTP capacity and close the lagoon. A master sewer meter would provide flow information for billing.

These alternatives are discussed in more depth below.

Description of Facility

Facility Name and Address

Forest Hills Subdivision WWTP
Forest Hills Drive
Williamston, SC 29697
Anderson County

Physical Location

Approximately one mile north of the intersection of Big Creek Road (SC Road #54) and Mahaffey Drive (SC Road S-4-212) in Anderson County, SC (Figure 1).

Ownership
Jacabb Utilities
210 W. North Second Street
Seneca, SC 29678
Contact: Mr. Steven R. Goldie, President
864-882-8194

Engineer
Goldie & Associates
210 W. North Second St.
Seneca, SC 29678
Contact: Mr. Paul Lewis, P.E.
864-882-8194 ext. 106
paul@goldieassociates.com

System Description
The system presently consists of approximately 4800 LF of gravity sewer along Sunset Court, Forest Drive, Ethridge Circle, Melanie Drive and Rentz Drive (Figure 2). Also included is a 0.165 acre lagoon, of which 0.131 acre is aerated with two blowers. A 0.034 acre stilling area is located at the discharge end of the pond. A trickling filter (Bio-Tower) for ammonia reduction as well as tablet chlorination and dechlorination are also on site. The sewer lines constructed in 1984 along Melanie and Rentz (approximately 3300 LF) are made of PVC, with a small amount of ductile iron pipe. The older lines along Forest Drive are also believed to be PVC. No construction date is known for these lines.

Service Area/Size
The WWTF currently serves approximately 34 homes in the Forest Hills Subdivision. However, plans are to add up to 47 additional units on the system, bringing the total to 81 units. (Figure 2)

Design Capacity / Actual Flows
The present system is permitted for 0.008 MGD. Actual flows at the lagoon are around 0.003 MGD (3,000 gpd). With the addition of the new units, at 400 gpd per unit * 79 units, the design flow will be 32,400 gpd (We will use 32,000 gpd for design purposes).

Utilization of Anderson County Capacity
We have a letter from Anderson County from 2002 agreeing to take this out of their capacity in the Wastewater Treatment Plant. If the Town agrees to accept the flow, we will work with Anderson County to get this letter renewed.

Compliance History
The lagoon has a history of ammonia excursions. These were in part alleviated by the installation of a Bio-tower system, approved in late 1996.

Fecal coliform and residual chlorine excursions have also occurred in past years. These excursions are primarily due to improper operation of the lagoon's tablet chlorination / dechlorination system.

The newest permit has discharge limits for cadmium, copper and lead. The plant will be unable to meet these limits without very advanced treatment equipment.

Necessity for Upgrade/Change of Treatment Capabilities

The system's current NPDES permit places it under a compliance schedule to upgrade its facilities to meet more stringent Ammonia-Nitrogen (NH3-N). total residual chlorine (TRC), cadmium, copper and lead limits. The current lagoon system also presents limited growth options for the subdivision; its currently permitted treatment capacity of 8,000 gallons per day is insufficient to support future expansion of the subdivision.

Also, because the discharge is within a Source Water Protection Area, the plant may be required to meet additional requirements, such as having to construct and equalization pond, have backup pumps and aerators, and redundant equipment.

Essentially, the upgrades to meet these requirements will be well into the hundreds of thousands of dollars, which obviously would be spread over only a handful of customers.

The small number of residences on the system results in a limited income. This income is used to support the costs of operating and maintaining the facility, including paying for a certified operator to conduct daily operations and maintenance. The additional costs of upgrading and repairing the facility create an unfavorable financial situation for the owner. These factors are the driving force behind the owner's desire to discharge to a larger wastewater treatment plant.

Options for System

1. **Jacabb Utilities can upgrade the existing lagoon system.**
   This option, for reasons previously discussed, is not very viable. The current system is in need of upgrades and repairs for which it does not produce the necessary income to keep the system viable.

2. **Jacabb Utilities to install lift station and maintain ownership of it.**
   This alternative considers the installation of sewage lift station which would pump the sewage to a Town of Williamston manhole located on Hamilton Street. Jacabb Utilities would assume the costs for engineering, permitting, purchase and installation of the lift station and the force main and as well as the costs associated with the lagoon closure, and retain ownership of the facilities. A master sewer meter would be installed for billing purposes. Jacabb Utilities would close the lagoon. Jacabb Utilities will continue to maintain the sewer lines in the subdivision.

Benefits to Town: The Town is able to use already existing sewage collection lines to add 34 existing, potentially up to 81, residences to its service area without having to deal with the current lagoon system. Based on an average sewer bill of $30.09[1], the income from the sewer for the present number of customers would be $1,023/ month or $12,276 per year. At complete build out of 79 lots, the income from sewer would be $29,247 per year.

Conclusion

The installation of a pump station with Jacabb retaining ownership appears to be a solution with benefits for both the current owner and for the Town of Williamston.

To recap costs and income potential for the Town:

Capital costs	$0
Annual O&M costs	$0
Annual Income (present)	$12,276
Annual Income (at build out)	$29,247

[1] Based on 5,000 gallons per month, using Town of Williamson's out of town city sewer bill $22.44 for the first 2,000 gallons plus 3,000 gallons * $3.00 / 1,000 gallons * 85% = $30.09.

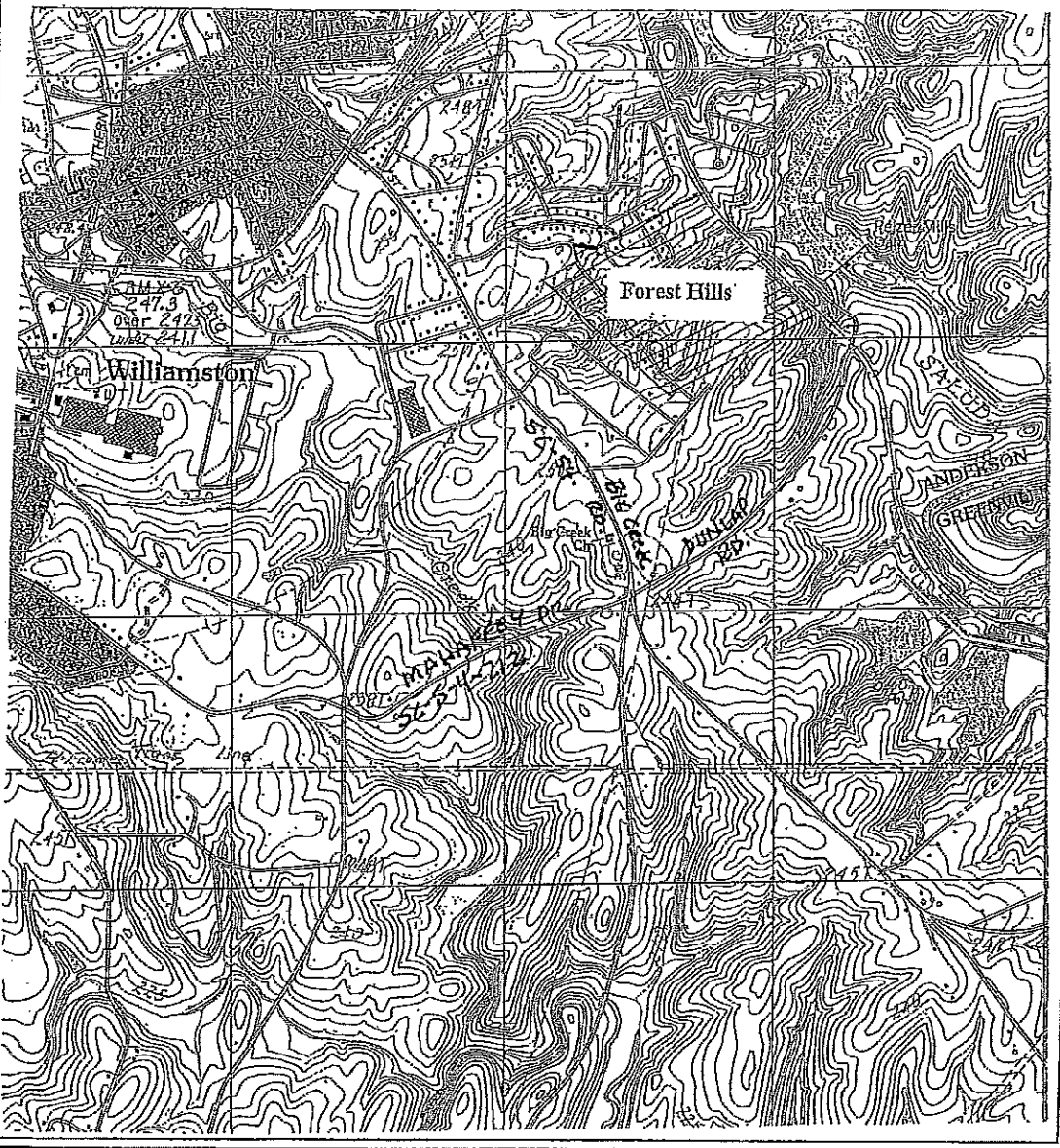


Figure 1
USGS Topographic Map
(Belton West)

Forest Hills Subdivision
Williamston, SC

N

Goldie & Associates
Project 714.1
February 2002

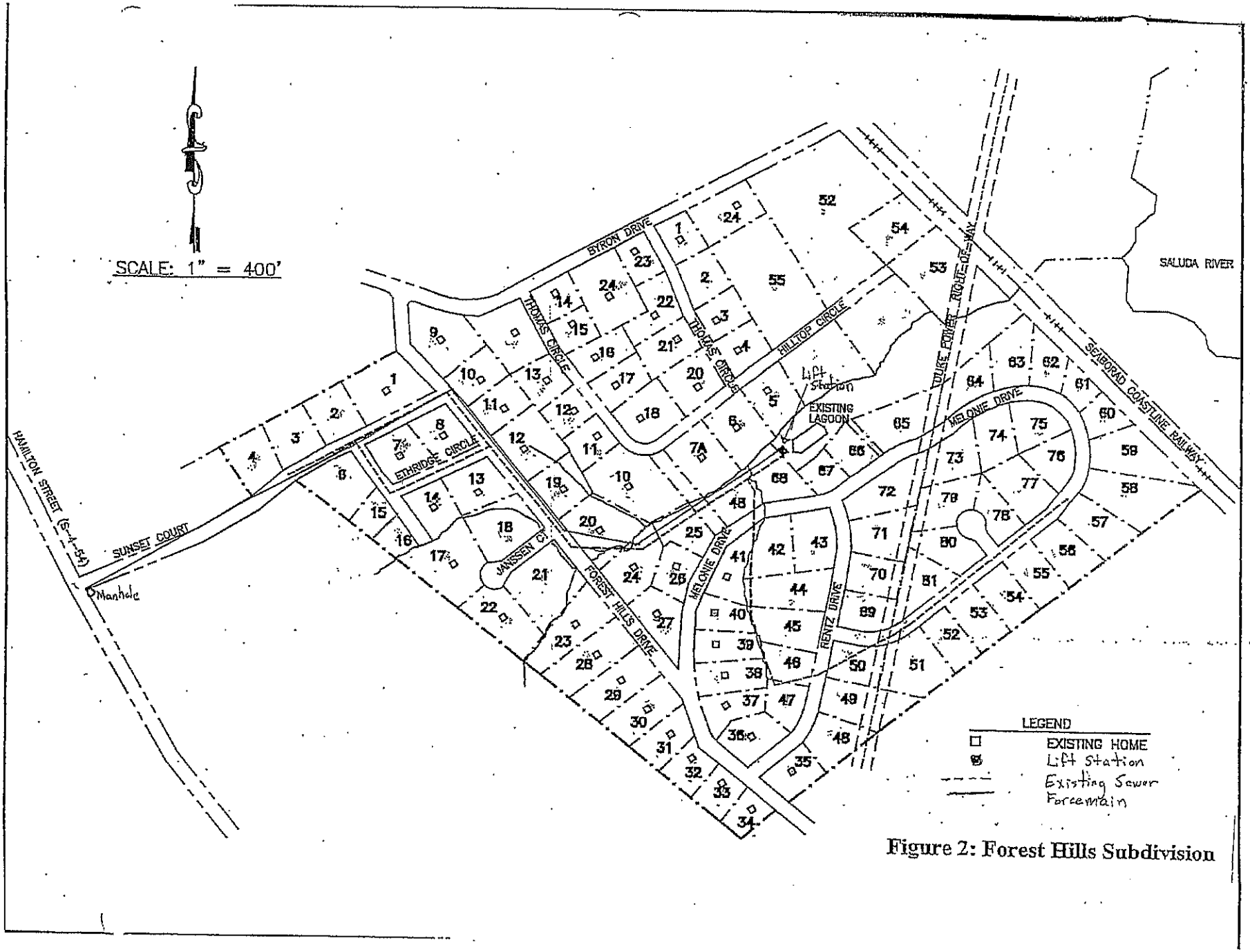


Figure 2: Forest Hills Subdivision

ATTACHMENT E

RECEIVED 8/20/07

Environmental Services Division
731 Michelin Blvd.
Anderson, South Carolina 29626

Wastewater Management
Tel. (864) 260-4023 ◆ Fax (864) 260-1002

ANDERSON COUNTY
SOUTH CAROLINA

Making News.
Making Progress.

August 16, 2007

Mr. Stephen Goldie
Jacabb Utilities
210 W. N. 2nd Street
Seneca, SC 29678

RE: ACCEPTANCE OF WASTEWATER FROM FOREST HILLS SUBDIVISION -- ANDERSON COUNTY

Dear Mr. Goldie:

This letter is to notify you of approval for Jacabb Utilities and Forest Hills Subdivision to utilize 32,000 gallons per day of Anderson County's capacity in the Town of Williamston's Big Creek East Wastewater Treatment Plant.

Attached is a copy of a letter from the Town of Williamston to Anderson County agreeing to treat the wastewater at their treatment plant.

Anderson County must have access to the flow monitoring station at any time to verify the accuracy of the flow meter.

Please copy Anderson County on the flow reports each month. Anderson County must also receive copies of all flow meter calibration reports on an annual basis. The flow must be maintained within +/- 10% of the actual.

Jacabb Utilities must own, maintain, and operate the lift station, the force main, and the collection lines in the subdivision.

The current billing cycle for the sewer bills for Anderson County is the 15th of each month following meter reading. Jacabb Utilities will be billed on this schedule for the total sewer discharge from the subdivision.

Should you have any questions or need any additional information, please call the Anderson County Wastewater Management Office at (864) 260-4023.

Sincerely,

Anderson County Wastewater Management

Jerry T. Singleton
Manager

JTS/cw

Cc: Mr. Phillip Clardy, Town of Williamston
Mr. Dick Rapak, DHEC, 2600 Bull Street, Columbia, SC 29201

County Administrator
Joey R. Preston

Council Members
Bob Waldrep
Chairman
District 1

Michael G. Thompson
Vice Chairman
District 5

Gracie S. Floyd
District 2

Larry E. Greer
District 3

Bill McAbee
District 4

Ron Wilson
District 6

M. Cindy Wilson
District 7

Clerk to Council
Linda N. Eddleman

Anderson County
All-America City

2001, 2002 J. Mitchell Graham Award Winner for Excellence in Governmental Performance
2002 Government Regional Cooperation Award Winner

ATTACHMENT F

April 20, 2007

Mr. Dewey Pearson
Anderson Co. Environmental Services
731 Michelin Blvd.
Anderson, SC 29626

Re: Forest Hills Flow Acceptance
G&A #735.11

Dear Mr. Pearson,

Jacabb Utilities LLC has requested that the flow from Forest Hills Subdivision be sent to the Williamston Big Creek Wastewater Treatment Plant. The Town Council voted to approve the acceptance of this domestic wastewater on April 2, 2007. The Town will work out the details of the connection of the force main. Jacabb Utilities will be required to read the sewer flow meter daily and record these readings on a flow report. The flow report must begin on the 15th of one month and end on the 14th of the next month. This report must be faxed to the Town of Williamston and to Anderson County by the 18th of the ending month of the flow report. The Town will bill Anderson County for the volume of sewer received each reporting period. Anderson County and the Town must have access to the flow monitoring station at any time to verify the accuracy of the flow reports that are submitted by Jacabb Utilities.

The flow meter must be calibrated annually by an outside contractor to ensure the sewer flows reported are maintained within +/- 10% of the actual flow. The flow calibration report must be submitted to both entities indicated above.

Jacabb Utilities will own and operate the lift station, the force main, and the collection lines in the subdivision.

We agree to accept this flow into the Big Creek Wastewater Treatment Plant once Anderson County authorizes Forest Hills Subdivision to utilize the 32,000 gpd from Anderson County's capacity.

Should you have any questions or need any additional information, please call the Town at (864) 847-7473.

Sincerely,

TOWN OF WILLIAMSTON

Phillip E. Clardy
Mayor

Cc: Steve Goldie, Jacabb Utilities
Sonya Harrison, Goldie & Associates

ATTACHMENT G

— file copy —

GOLDIE & ASSOCIATES

engineering, environmental and laboratory services

May 31, 2007

SC DHEC, Bureau of Water
Water Facilities Permitting Division
2600 Bull Street
Columbia, SC 29201-1708

Re: Forest Hills Subdivision Lift Station
Goldie & Associates Project # 1001.11.5
DHEC Order # 06-128-W

To Whom It May Concern:

Enclosed, in response to DHEC Order # 06-128-W, please find a wastewater submittal for Forest Hills Subdivision Lift Station. This submittal includes the following:

- Original and three copies of the permit application
- Three copies of the construction plans
- Additional overall plan showing proposed and existing sewer
- Three copies of an 8 ½ x 11 location map
- Three copies of the design calculations
- Letter from Jacabb Utilities
- A submittal fee for $350
- Please note that ACOG 208-201 certification was applied for 5/24/2007 (copy of application attached)

If you have any questions, or need additional information, please give Adam Hogan a call at 864-882-8194, Ext # 123. Thank you for your help with this project.

Sincerely,
Goldie & Associates

Julie Pope

Julie Pope

210 W. North Second Street • Seneca, South Carolina 29678 • Phone (864) 882-8194 • Fax (864) 882-0851

Construction Permit Application Water/Wastewater Facilities

BUREAU OF WATER

DRP SUBMITTAL: No [X] Yes [ ]

SELECT ONE ➧ [ ] Water Facilities [X] Wastewater Facilities [ ] Water & Wastewater Facilities

I. **Project Name:** Forest Hills S/D Lift Station **County:** Anderson

II. **Project Location** (street names, etc.):

Off of Melonie Drive near Williamson

III. **Project Description(s):** *Water System:*

Wastewater System:

Installation of a lift station, approximately 3,422 LF of 4" PVC forcemain, approximately 279 LF of 8" PVC gravity sewer, 2 standard manholes, 1 doghouse manhole, as well as all other necessary valves and appurtenances

Project Type (A-Z): Water: Wastewater: C Pump Station and/or Force Main

IV. ***Initial* Owner:** [Time of Application] Name/Organization: JACABB Utilities, LLC

Address: 210 W. North Second Street City: Seneca State: South Carolina Zip: 29678 Phone: (864) 882-8194

V. ***Final* Owner:** [After Construction] Name/Organization: JACABB Utilities, LLC

Address: 210 W. North Second Street City: Seneca State: South Carolina Zip: 29678 Phone: (864) 882-8194

VI. **Entity Responsible for Final Operation & Maintenance of System:**

Water System: Name: Address:

City: State: Zip: Phone: Fax:

Wastewater System: Name: JACABB Utilities, LLC Address: 210 W. North Second Street

City: Seneca State: South Carolina Zip: 29678 Phone: (864) 882-8194 Fax: (864) 882-0851

VII. **Engineering Firm:** Name: Goldie & Associates Address: 210 W. North Second Street

City: Seneca State: South Carolina Zip: 29678 Phone: (864) 882-8194 Fax: (864) 882-0851

VIII. **Is this project:** A) Part of a phased project? No[X] Yes[ ]. If Yes, Phase _____ of _____

B) A revision to a previously permitted project? No[X] Yes[ ]. If Yes, Permit # _____

Date Approved: _____ *(MM/DD/YYYY)* Project name (if different): _____

C) Submitted based on a Schedule of Compliance or Order issued by DHEC? No[ ] Yes[X]. Order # 06-128-W

D) Anticipating funding by the State Revolving Fund (SRF)? No[X] Yes[ ].

E) Crossing a water body? (e.g., river, creek) No[ ] Yes[X]. If Yes, Name of water body Saluda River tributary

IX. **Are Standard Specifications approved by DHEC being used on this project?** No[ ] Yes[X]. If Yes:

Water: Date Approved: _____ *(MM/DD/YYYY)* Approved for whom: _____

Wastewater: Date Approved: 08/27/2003 *(MM/DD/YYYY)* Approved for whom: Adam Hogan

X. **Wastewater Systems:** A) Type: Domestic [X] Process *(Industrial)* [ ] Combined *(Domestic & Process)* [ ]

B) Total average design flow of the project not to exceed 32,000 GPD

C) *Sewers or Pretreatment* 1. Name of facility (e.g., POTW) treating the wastewater: Big Creek East WWTP

2. NPDES/ND Number of facility in Item #1: SC 0046841

Treatment Systems 3. Date Preliminary Engineering Report (PER) approved: _____ *(MM/DD/YYYY)*

4. NPDES/ND application submitted? No[ ] Yes[ ]. If Yes, Date: _____ *(MM/DD/YYYY)*

Disposal Sites 5. Effluent Disposal Site (Description): _____

6. Sludge Disposal Site (Description): _____

XI. **Water Systems:** Project located within city limits? No[ ] Yes[ ].

Public water system providing water (Name & System ID No.): _____ No.: _____

New water system (including master meter)? No[ ] Yes[ ]. If Yes, System name: _____

XII. **Type of Submittal:** Complete Section A (Standard) *or* Section B (Delegated Review Program - DRP).

A) Standard Submittal *must* include the following, where applicable:

- [x] 1. A transmittal letter outlining the submittal package.
- [x] 2. The original construction permit application, properly completed, with three (3) copies.
- [x] 3. Three (3) sets of signed and sealed plans and specifications. Specifications may be omitted if approved standard specifications are on file with DHEC.
- [x] 4. One (1) additional overall plan sheet showing the proposed and existing (only in the area of proposed construction) water and wastewater lines (highlighted for identification) and their sizes.
- [x] 5. Three (3) sets of the appropriate design calculations. WASTEWATER: Design flow (based on R.61-67, Appendix A), pump station calc's. and pump curve. WATER: Recent flow test from a location near the tie-on site, design calc's. indicating pressure maintained in the distribution system during max. instantaneous demand, fire flow and flushing velocities achieved. Number/types of service connections, well record form, pumping test results, etc.
- [x] 6. Three (3) copies of a detailed 8½" x 11" location map, separate from the plans.
- [ ] 7. Three (3) copies of construction easements unless the project owner has the right of eminent domain.
- [x] 8. A letter(s) from the entity supplying water and/or providing wastewater treatment stating their willingness and ability to serve the project, including pretreatment permits, if applicable. The letter should include the specific flow and, when applicable, the specific number of lots being served.
- [x] 9. A letter(s) from the entity agreeing to be responsible for the O&M of the water and/or wastewater system.
- [x] 10. Application fee enclosed $ 350.00 . (Refer to Instructions).
- [ ] 11. WATER SYSTEMS: a) A letter from the local government which has potable water planning authority over the area, if applicable, in which the project is located, stating project consistency with water supply service plan for area.
  b) For wells, four (4) copies of a wellhead protection area inventory.
  c) For new wells, a viability demonstration is required in accordance with Regulation 61-58.1.B.(4).

Note: Other approvals may include 208 and OCRM certification, and navigable waterway permitting.

B) DRP submittal (treatment plants are not covered) *must* include the following, where applicable:

- [ ] 1. A transmittal letter, signed by the professional engineer representing the DRP entity, noting this is a DRP submittal. The letter should state that the project has been reviewed and complies with R.61-58 and/or R.61-67.
- [ ] 2. The original construction permit application, properly completed, with two (2) copies.
- [ ] 3. Two (2) sets of the signed and sealed plans.
- [ ] 4. One (1) additional plan sheet with water and wastewater lines highlighted, as required under Sec. XII.A.4. above.
- [ ] 5. Two (2) sets of the appropriate design calculations. WASTEWATER: Same information as required under Section XII.A.5. above. WATER: Same information as required under Section XII.A.5. above.
- [ ] 6. Two (2) copies of a detailed 8½" x 11" location map, separate from the plans.
- [ ] 7. Two (2) copies of construction easements, unless the project owner has the right of eminent domain.
- [ ] 8. DHEC's Ocean and Coastal Resource Management certification (for projects in applicable counties).
- [ ] 9. DHEC's Water Quality permit or conditions for placement in navigable waters, and other Agency approvals.
- [ ] 10. WASTEWATER SYSTEMS: a) A letter of acceptance from the entity providing the treatment of the wastewater that includes the specific flow and, when applicable, the specific number of lots being accepted.
  b) A letter from the organization agreeing to be responsible for the O&M of the sewer system.
  c) The 208 Plan certification from the appropriate Council of Governments (designated 208 areas), or from DHEC on the non-designated 208 areas.
- [ ] 11. WATER SYSTEMS: A letter from the local government which has potable water planning authority over the area, if applicable, in which the project is located, stating project consistency with water supply service plan for area.
- [ ] 12. Fee of $75 for water and $75 for sewer ($150 if combined).

Note: The DRP entity should ensure that a copy of the final approved plans are returned to the design engineer.

XIII. Construction plans, material and construction specifications, the engineering report including supporting design data and calculations are herewith submitted and made a part of this application. I have placed my signature and seal on the engineering documents submitted, signifying that I accept responsibility for the design of this system, and that I have submitted a complete administrative package.

Engineer's Name (Printed): Adam Hogan Signature: Adam Hogan

S.C. Registration Number: 25472 Registered Professional Engineer

XIV. Prior to final approval, I will submit a statement certifying that construction is complete and in accordance with the approved plans and specifications, to the best of my knowledge, information and belief. This certification will be based upon periodic observations of construction and a final inspection for design compliance by me or a representative of this office who is under my supervision.

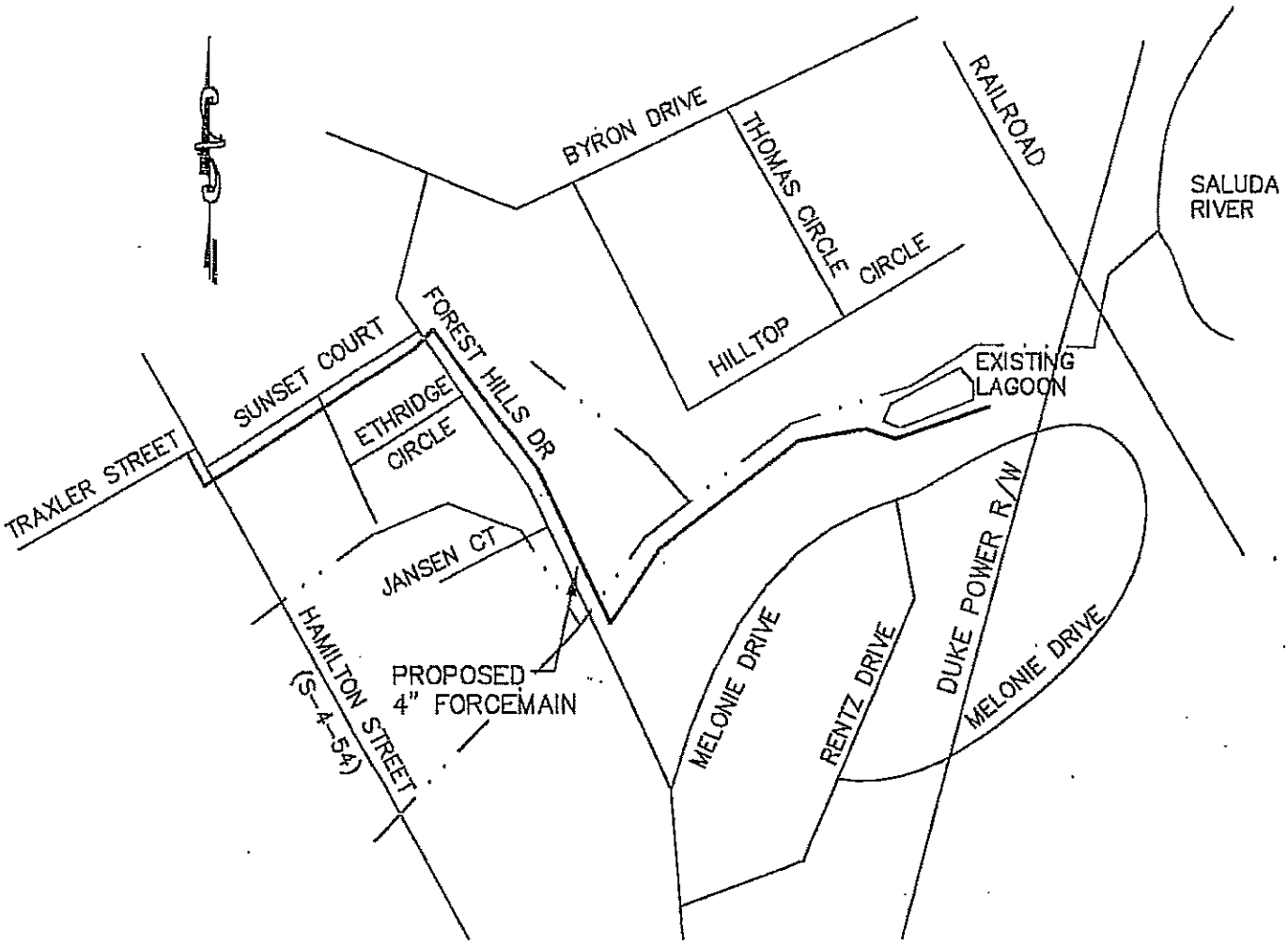
Engineer's Name (Printed): Adam Hogan Signature: Adam Hogan

S.C. Registration Number: 25472 Registered Professional Engineer

XV. I hereby make application for a permit to construct the project as described above. I have read this application and agree to the requirements and conditions and agree to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection.

Owner's Name (Printed): Steve Goldie Signature:

Owner's Title: Managing Owner Date: (MM/DD/YYYY)



Forest Hills S/D Lift Station
Goldie and Associates Project # 1001.11.5

Vicinity Map

TO: Chip Bentley
Appalachian Council of Governments
P.O. Drawer 6668
Greenville, SC 29606
Phone (864) 242-9733 • Fax (864) 242-6957

FROM: Goldie & Associates Project # 1001.11.5

DATE: May 24, 2007

SUBJECT: Request for 208/201 plan conformance certification

1. Project Name	**Forest Hills S/D Lift Station**
2. County	**Anderson**
3. General Location (Street Address & Location Map)	**Off of Melonie Drive near Williamston**
4. Type of Action for Review i.e. Construction Permit PER NPDES Permit Review	**Construction Permit**
5. Type Project i.e. Gravity Sewer WWTP Expansion Pump Station	**Gravity Sewer, Forcemain, Pump Station**
6. Type of Waste:	***Domestic X and/or Process***
7. Existing Volume (GPD)	**0**
8. Proposed Volume (GPD)	**32,000 gpd**
9. Disposal Location (WWTP Name & NPDES#)	**Big Creek East WWTP SC 0046841**
10. Project Engineer	**Adam Hogan**
Phone	**(864) 882-8194 ext 123**
11. DHEC Contact:	
Phone:	

Please return the completed form and any additional information to Chip Bentley by fax or mail at the Appalachian Council of Governments. The fax number and address are provided above. Please feel free to call if you have any questions or need additional information.

JACABB UTILITIES, LLC

May 31, 2007

Water Facilities Permitting Division
SC Department of Health & Environmental Control
2600 Bull Street
Columbia, SC 29201

Re: Forest Hills Subdivision Lift Station
Goldie and Associates Project # 1001.11.5

To Whom It May Concern:

We hereby state that we are willing and able to own, operate and maintain the proposed sewer system, for the above referenced project, upon construction and approval to place into operation.

Sincerely,

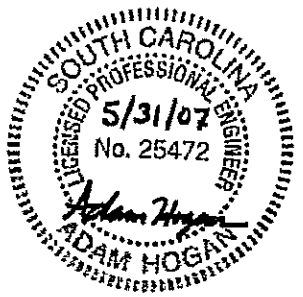
JACABB Utilities

Steve Goldie
Managing Owner

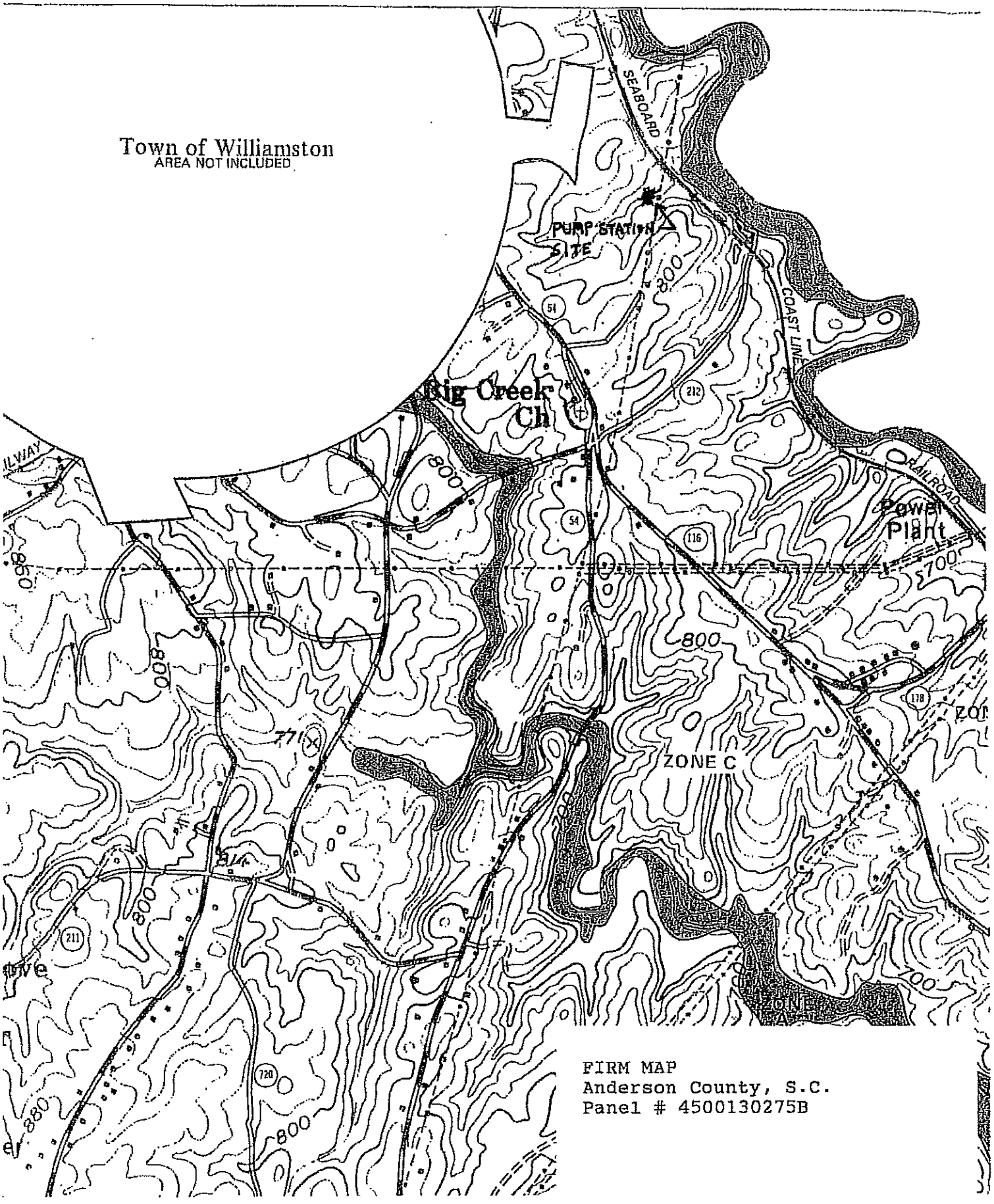
210 W.N. Second Street · Seneca · SC · 29678 · phone · 864-882-8194 · fax · 864-882-0851

Lift Station Design
for
Forest Hills Subdivision

Goldie & Associates
Project #1001.11.5



USGS Location Map
Belton East Quad
Anderson County, S.C.
Scale: 1" = 2,000'



FIRM MAP
Anderson County, S.C.
Panel # 4500130275B

Forest Hills Subdivision Sewer Lift Station

Unit Contributory Loading - Current

Gravity Sewer Loading

Average Daily Flow per Residence =	400	GPD
Number of Residences =	35	
ADF =	14,000	GPD
ADF =	9.7	gpm (based on 24 hr/day)
Peaking Factor =	2.5	
PDF =	24.3	gpm

Gravity Sewer Capacity

Gravity Sewer Diameter, d =	8	in
Manning's Coefficient, *n* =	0.013	*(for PVC sewerline)*
Gravity Sewer XS-Area, A =	0.35	ft^2
Hydraulic Radius, R =	0.2	in
Min. Gravity Slope, S =	0.005	ft/ft
Full-Flow Capacity, Q =	0.86	cfs
Full-Flow Capacity, Q =	384.6	gpm

∴ Gravity sewer capacity is adequate.

Pump Station Design Flow

- **Peak Loading**

From unit contributory loading above,

PDF = 24.3 gpm

- **Required Flushing Flow**

Required Flushing Velocity, v =	2.00	fps	
Forcemain Diameter, d =	4	in	*(for 4" PVC)*
Forcemain XS-Area, A =	0.09	ft^2	

$$Q = V * A$$

Required Flushing Flow =	0.17	cfs
Required Flushing Flow =	78.3	gpm

∴ Use pumping rate of 100 gpm.

Forest Hills Subdivision Sewer Lift Station

Unit Contributory Loading - Buildout

Gravity Sewer Loading

Average Daily Flow per Residence =	400	GPD
Number of Residences =	80	
ADF =	32,000	GPD
ADF =	22.2	gpm (based on 24 hr/day)
Peaking Factor =	2.5	
PDF =	55.6	gpm

Gravity Sewer Capacity

Gravity Sewer Diameter, d =	8	in
Manning's Coefficient, *n* =	0.013	*(for PVC sewerline)*
Gravity Sewer XS-Area, A =	0.35	ft^2
Hydraulic Radius, R =	0.2	in
Min. Gravity Slope, S =	0.005	ft/ft
Full-Flow Capacity, Q =	0.86	cfs
Full-Flow Capacity, Q =	384.6	gpm

∴ Gravity sewer capacity is adequate.

Pump Station Design Flow

- **Peak Loading**

From unit contributory loading above,

PDF = 55.6 gpm

- **Required Flushing Flow**

Required Flushing Velocity, v =	2.00	fps	
Forcemain Diameter, d =	4	in	*(for 4" PVC)*
Forcemain XS-Area, A =	0.09	ft^2	

$$Q = V * A$$

Required Flushing Flow =	0.17	cfs
Required Flushing Flow =	78.3	gpm

∴ Use pumping rate of 100 gpm.

Forest Hills Subdivision Sewer Lift Station

Pump Station System Curve (4" PVC Forcemain)

Static Head

High Point Elevation = 281.00 ft *(app. discharge elevation - high point)*
Low Point Elevation = 180.75 ft *(app. lift station pump off - low point)*

Static Head Loss = High Point Elevation - Low Point Elevation

Friction Head

Actual Pipe Length = 3,422 ft
Pipe Diameter = 4.0 in

Minor Losses: 5 - 90° Bends, 12 - 15° Bends

	KL	# Bends	∑KL
90° Bend	0.8	4	3.2
		∑KL =	3.2

Minor Loss Resistance Coefficient = KM = $\sum KL / 2gA^2$ = 0.0040

where KL = minor loss coefficient
g = acceleration due to gravity (32.2 ft/s)
A = cross sectional area of the pipe ($\pi d^2/4$)

Head Loss Due to Minor Losses = KM*(0.002228*Q)^2

where KM = minor loss resistance coefficient
Q = flow (gpm)

Hazen and Williams Friction Factor Equation

$$f = 0.2083 * \left(\frac{100}{C}\right)^{1.85} * \frac{Q^{1.85}}{d^{4.8655}}$$

where C = roughness factor (= 130 for D.I.P.)
d = inside diameter in inches
Q = flow in gpm

Eq. Length = 1.0 * Actual Pipe Length

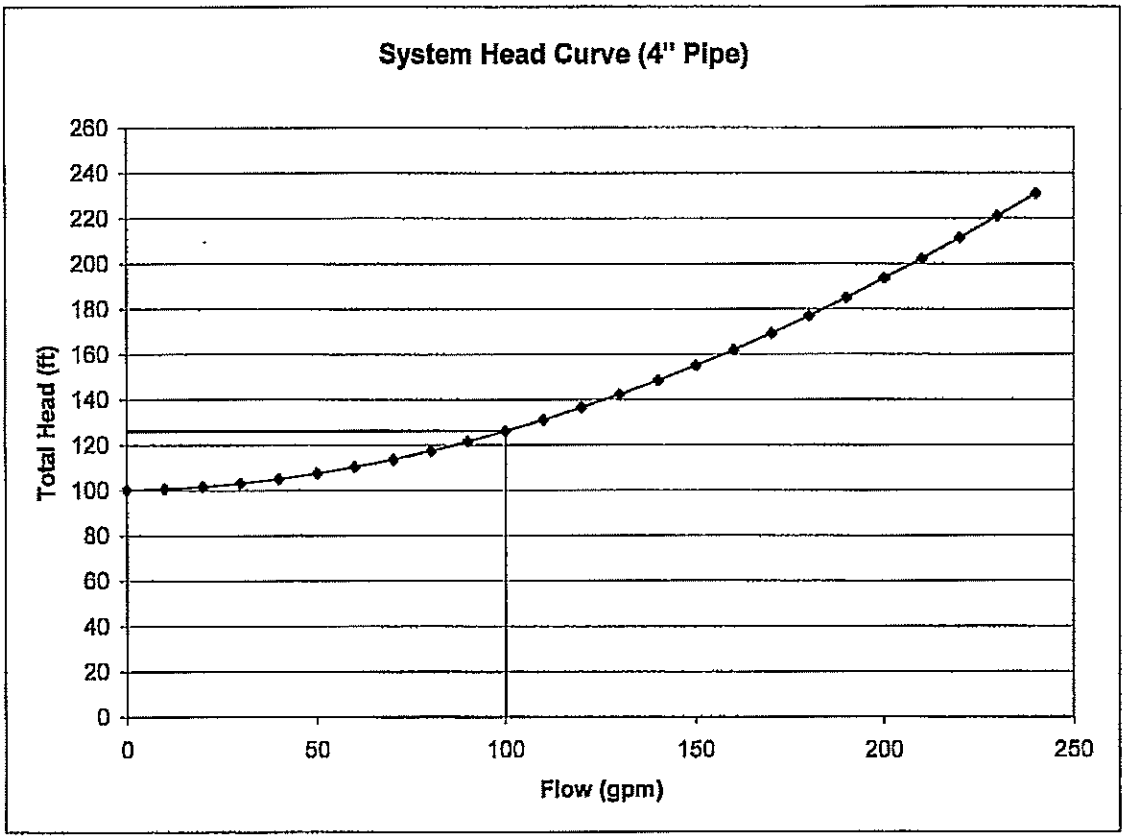
Friction Head Loss = f * (L / 100)

Total Head = Static Head Loss + Friction Head Loss

Forest Hills Subdivision Sewer Lift Station

Pump Station System Curve (4" PVC Forcemain)

	Elevation		Static	Minor	Eq. Length, L	Friction Factor,	Friction Head	Total Head
Flow, Q (gpm)	High	Low	Head Loss	Head Loss	(ft)	f (ft/100 ft)	Loss (ft)	(ft)
0	281	180.75	100.25	0	3422	0	0.00	100.3
10	"	"	100.25	0.00000	3422	0.0107	0.37	100.6
20	"	"	100.25	0.00001	3422	0.0385	1.32	101.6
30	"	"	100.25	0.00002	3422	0.0815	2.79	103.0
40	"	"	100.25	0.00003	3422	0.1388	4.75	105.0
50	"	"	100.25	0.00005	3422	0.2097	7.18	107.4
60	"	"	100.25	0.00007	3422	0.2939	10.06	110.3
70	"	"	100.25	0.00010	3422	0.3908	13.37	113.6
80	"	"	100.25	0.00013	3422	0.5004	17.12	117.4
90	"	"	100.25	0.00016	3422	0.6222	21.29	121.5
100	"	"	100.25	0.00020	3422	0.7561	25.87	126.1
110	"	"	100.25	0.00024	3422	0.9019	30.86	131.1
120	"	"	100.25	0.00028	3422	1.0594	36.25	136.5
130	"	"	100.25	0.00033	3422	1.2285	42.04	142.3
140	"	"	100.25	0.00038	3422	1.4090	48.21	148.5
150	"	"	100.25	0.00044	3422	1.6008	54.78	155.0
160	"	"	100.25	0.00050	3422	1.8038	61.73	162.0
170	"	"	100.25	0.00057	3422	2.0179	69.05	169.3
180	"	"	100.25	0.00064	3422	2.2429	76.75	177.0
190	"	"	100.25	0.00071	3422	2.4789	84.83	185.1
200	"	"	100.25	0.00079	3422	2.7257	93.27	193.5
210	"	"	100.25	0.00087	3422	2.9831	102.08	202.3
220	"	"	100.25	0.00095	3422	3.2512	111.26	211.5
230	"	"	100.25	0.00104	3422	3.5299	120.78	221.0
240	"	"	100.25	0.00113	3422	3.8191	130.69	230.9



Technical Information

GRP79/3

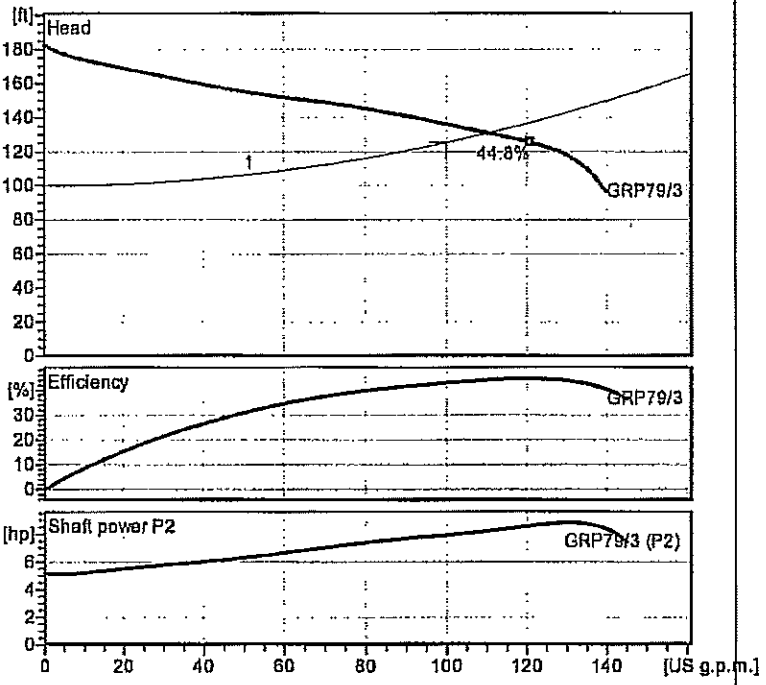
Operating data	
Flow	100 US g.p.m.
Head	125 ft
Pump efficiency	44.2%
Required power	8.25 hp
NPSH	
Fluid	Water, clean
Temperature	68 °F
Pumps type	Single head pump
No. of pumps	1

Pump data	
Type	GRP79/3
Manufacturer	HOMA
Series	GRP (FM)
Impeller	vane impeller with cutter sys.
Impeller size	6 11/16"
Solid size	
Discharge port	2" ANSI

Motor data	
Rated voltage	460 V DIR
Frequency	60 Hz
Power output (P2)	8.9 hp
Rated speed	3450 rpm
Number of poles	2
Efficiency	88 %
Rated current	11 A
Degree of protection	IP 68

Materials	
Motor housing	Cast iron ASTM A48; Class 40B
Pump housing	Cast iron ASTM A48; Class 40B
Impeller	Cast iron ASTM A48; Class 40B
Cutting system	Hardened Stainless Steel 55 Rockwell C
Motor shaft	AISI 430 F Stainless Steel
Bolts	AISI 304 Stainless Steel
Elastomeres	Nitrile Rubber
Motor jacket	Stainless steel
Mechanical seal on medium side	SIC / SIC
Mechanical seal on motor side	SIC / SIC
Upper Bearing	Deep Groove Ball Bearing
Lower Bearing	Double row angular ball bearing

Testnorm
ISO 9906



Wet well installation with auto coupling system

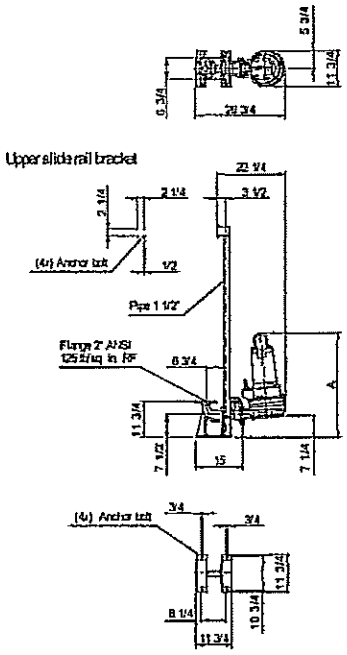


Table Dimensions
(Inch)

A	31

Dimensions in mm, letters see table

2.0 - 21.02.2006 (Build 105)

Project	Project no.:	Created by:	Page: 1	Date: 5/24/2007

HOMA
PUMPEN MIT SYSTEM

Performance Curve

GRP79/3

Impeller

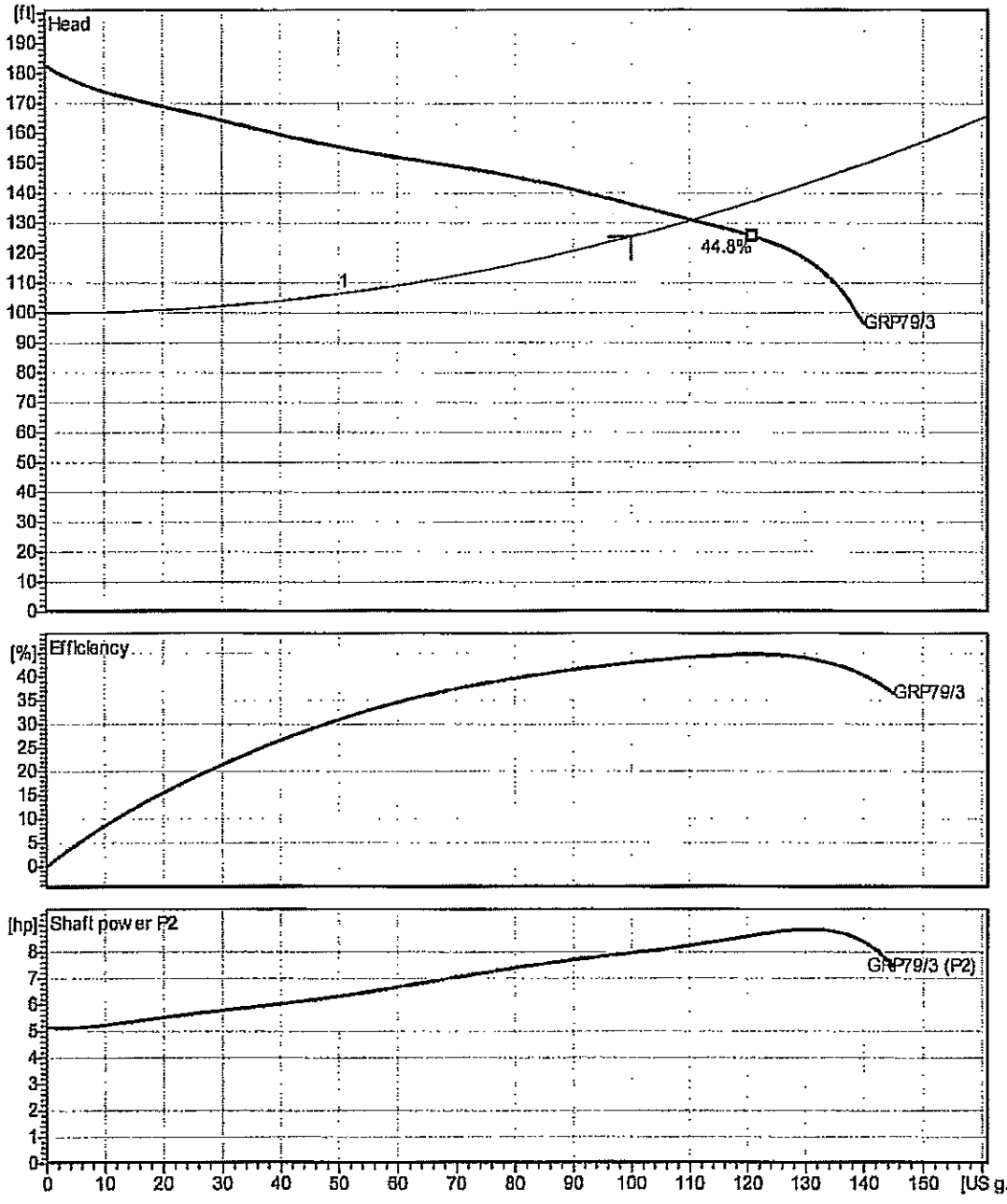
Impeller type:	Solid size Ø:	Max. Ø:	Min. Ø:	Sel. Ø:	
vane impeller with cutter sys.		7 11/16"	6 1/8"	6 11/16"	

Operating data

Speed:	Frequency:	Duty point:	Suction port:	Discharge port:
3450 rpm		Q = 100 US g.p.m. H = 125.4 ft		2" ANSI

Power data referred to:	Testnorm:
Water [100%] ; 68°F; 62.322lb/ft³; 1.0818E-5ft²/s	ISO 9906

Curve number:



2.0 - 21.02.2006 (Build 105)

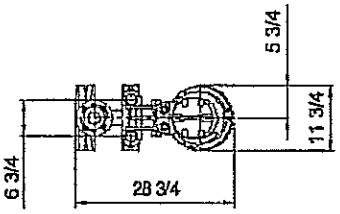
Project	Project no.:	Created by:	Page:	Date:
			2	5/24/2007

Dimensions

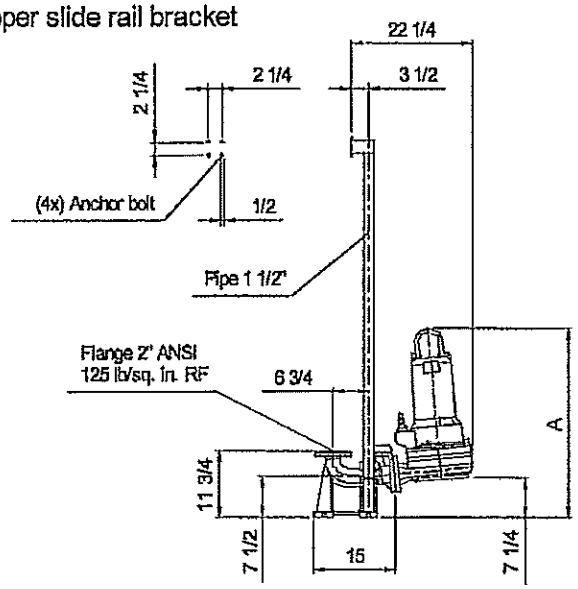
GRP79/3

Wet well installation with auto coupling system

Dimensions in mm, letters see table



Upper slide rail bracket



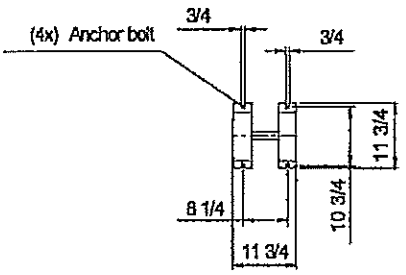


Table Dimensions (Inch)

A	31

2.0 - 21.02.2006 (Build 105)

Project	Project no.:	Created by:	Page: 3	Date: 5/24/2007

HOMA
PUMPEN MIT SYSTEM

Technical Data

GRP79/3
GRP79/3 U

Operating data

Fluid	Water, clean		Flow	100	US g.p.m.
Temperature	68	°F	Static head H geo	100	ft
Density	62.32	lb/ft³	Manometric head H man	125.4	ft
Kin. viscosity	1.082E-5	ft²/s	Pump efficiency	44.2	%

Pump

Pump Code	GRP79/3		Speed	3450	rpm
Suction port			Head Max.	182.9	ft
Discharge port	2" ANSI		Head Min.	96.5	ft
Impeller type	vane impeller with cutter sys		Flow Max.	140.0	US g.p.m.
Solid size		inch	Pump efficiency max.	44.8	%
Impeller Ø	6.69	inch	Required rated power max.	8.8	hp

Motor

Motor version	Submersible motor			Insulation class		F
Motor name	AM173.10T/2/3			Degree of protection		IP 68
Frequency	60	Hz		Starting Method		T3C
Power input (P1)	10.1	hp		Ex		
Power output (P2)	8.9	hp		Explosion protection		
Rated speed	3450	rpm		Efficiency at % rated power	100%	88 %
Rated voltage	460 V	3~			75%	88 %
Rated current	11.0	A			50%	87 %
Starting current, direct starting	69.5	A		cos phi at % rated power	100%	0,86
Starting current, star-delta	23.2	A			75%	0,82
Service factor	1.15				50%	0,72

Shaft seal	Mechanical seal on motor side	SiC / SiC
	Mechanical seal on medium side	SiC / SiC
Bearing	Lower Bearing	Double Row Angular Ball Bearing
	Upper Bearing	Deep Groove Ball Bearing
Remarks		

Cable data / Weight

Starting mode: direct

Motorversion		T 8,9 /C	TU 8,9				
Power cable		10G1,5	10G1,5				
Type of power cable		H07RN-F PLUS	H07RN-F PLUS				
Control cable							
Type of control cable							
Cable length	ft	32.8					
Weight aggregat	lb	On demand	On demand				

Materials

Motor housing	Cast Iron ASTM A48; Class 40B	Bolts	AISI 304 Stainless Steel
Pump housing	Cast Iron ASTM A48; Class 40B	Elastomeres	Nitrile Rubber
Impeller	Cast Iron ASTM A48; Class 40B	Motor jacket	Stainless steel
Cutting system	Hardened Stainless Steel 55 Rockwell C		
Motor shaft	AISI 430 F Stainless Steel		

Project	Project no.:	Created by:	Page:	Date:
			4	5/24/2007

2.0 - 21.02.2006 (Build 105)

Forest Hills Subdivision Sewer Lift Station

Pump Station Cycle Time Calculations - Buildout

Based on the pump curve, the pump will operate at

100 gpm @ 126 ft TDH

The pump is a HOMA Grinder Pump Model GRP79/3, 2", 10 Hp w/impeller 6-11/6".

Wet Well Volume

Wet Well Diameter = 4 ft

$$V = \frac{\pi}{4} * d^2 * 1\frac{ft}{ft} * 7.48\frac{gal}{ft^3}$$

V = 94.0 gal/ft

Run Time & Detention Time

- Try 1'-6" of storage between "Pump Off" & "Lead On" floats.

Depth of Storage Provided = 1.50 ft

Storage Volume Provided = 141.0 gal

t_{fill} = 6.34 min *(based on ADF in)*

- Use the 100 gpm pump rate.

Q_{empty} = 100 gpm

Q_{fill} = 22 gpm *(based on ADF)*

$$t_{empty} = \frac{V}{Q_{empty} - Q_{fill}}$$

t_{empty} = 1.81 min

Run Time & Detention Time

	6.34	minutes - detention time
+	1.81	minutes - pump run time
	8.16	minutes - cycle time

∴ 7.36 cycles/hr

Forest Hills Subdivision Sewer Lift Station

Pump Station Cycle Time Calculations - Current

Based on the pump curve, the pump will operate at

100 gpm @ 126 ft TDH

The pump is a HOMA Grinder Pump Model GRP79/3, 2", 10 Hp w/impeller 6-11/6".

Wet Well Volume

Wet Well Diameter = 4 ft

$$V = \frac{\pi}{4} * d^2 * 1\frac{ft}{ft} * 7.48\frac{gal}{ft^3}$$

V = 94.0 gal/ft

Run Time & Detention Time

- Try 1'-6" of storage between "Pump Off" & "Lead On" floats.

Depth of Storage Provided = 1.50 ft

Storage Volume Provided = 141.0 gal

t_{fill} = 14.50 min *(based on ADF in)*

- Use the 100 gpm pump rate.

Q_{empty} = 100 gpm

Q_{fill} = 10 gpm *(based on ADF)*

$$t_{empty} = \frac{V}{Q_{empty} - Q_{fill}}$$

t_{empty} = 1.56 min

Run Time & Detention Time

14.50	minutes	- detention time
+ 1.56	minutes	- pump run time
16.06	minutes	- cycle time

∴ 3.74 cycles/hr

Hersey PRODUCTS

Model MVR

Magnetic Drive Vertical Turbine Meters
Sizes 3/4", 1", 1-1/2", 2", 3", 4" and 6"

Features

APPLICATIONS: Measurement of water for residential, commercial and industrial applications where higher flow rates are encountered, and where sensitivity to low flow is also important. Hersey MVR meters are among the most sensitive vertical turbine meters available and may be used in place of compound meters in some applications. The compact design and integral strainer (separate external strainer is not needed) of Model MVR meters facilitate installation in tight spaces. They are ideal where flexibility is needed to meet wider flow ranges, where water temperatures are elevated between 80F and 130F, or where sand particles or other small debris may be encountered. May be installed vertically or horizontally for greater installation flexibility.

Optional ring strainer is available on 3/4", 1" and 1-1/2" meters. Cast iron bottoms on 3/4", 1" and 1-1/2" size meters are enamel painted and include a plastic liner to separate it from the waterway.

CONFORMANCE TO STANDARDS: Hersey Model MVR Water Meters comply with ANSI/AWWA Standard C701 Class I. Each meter is tested to ensure compliance.

CONSTRUCTION: Hersey Model MVR Water Meters consist of three basic parts: maincase; rotor assembly; and a permanently sealed register. Maincases are made of bronze for longer life, and have greater recycling value over plastic meters. Rotor assemblies are thermoplastic, which is dimensionally stable and will not corrode. Retro Thrust® rotor design extends the life of the meter by dividing wear between two points: during low flow the tungsten carbide thrust bearing floats against a sapphire bearing surface; during high flow the stainless steel shaft gently contacts a second sapphire bearing. During medium flow, the rotor floats between the thrust bearings without contact.

REGISTER: Permanently sealed register has double "L" seal to eliminate dirt and moisture infiltration and lens fogging. The standard register has a straight-reading odometer type totalization display; a 360° test circle with center sweep hand; and a low flow (leak) detector. Gears are self lubricating, molded plastic for long life and minimum friction. Standard gearing is used, making registers interchangeable size by size.

Solid state remote reading systems are available for all Model MVR Water Meters (see back for options).

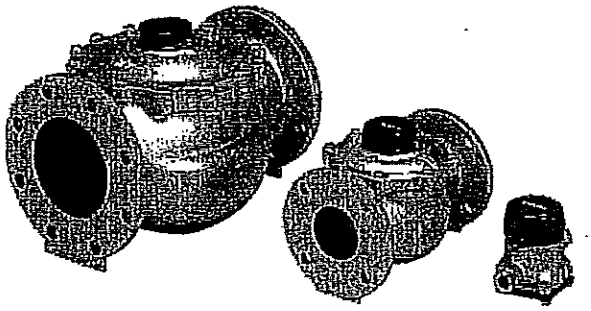
MAGNETIC DRIVE: Reliable, proven design using a four pole radial magnet for reliable magnetic coupling. Register is completely separate from waterway.

OPERATION: Water flows through the integral strainer and into the vertical turbine assembly. There the direction of the water flow is directed by the hub into the rotor at the precise angle necessary for accurate measurement over the full range of flow rates. The turbine turns freely and rotates in direct proportion to the volume of water passing through the meter.

The Model MVR meter turbine operates more quietly than conventional disc or piston meters.

MAINTENANCE: The Hersey Model MVR Water Meters are designed and manufactured to provide long service life with virtually no maintenance required. The register on all sizes, and meter interior and strainer on sizes 3" and larger, can be replaced without removing the meter from the line. Modular design and economical internal parts allow for inexpensive speedy rebuilds.

CONNECTIONS: Available with external (N.P.S.M.) straight pipe threads (ANSI B1.20.1) on 3/4" and 1" sizes; integral two-bolt oval flanges or internal (NPT) pipe threads (ANSI B1.20.1) on 1-1/2" and 2" sizes. ANSI class 150 flanges on 3" through 6" sizes (class 125 cast iron or class 150 bronze companion flanges available on request).



3/4", 1", 1-1/2", 2", 3", 4", 6" Magnetic Drive Vertical Turbine Meters

1-1/2", 2" Compact Magnetic Drive Vertical Turbine Meters

Materials and Specifications

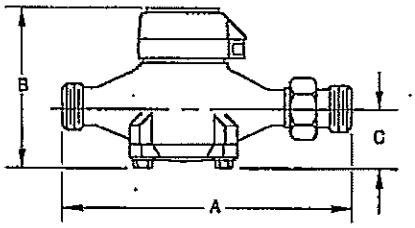
- **MODEL NUMBER** ..... MVR 30 (3/4"), MVR 50 (1"), MVR 100 (1-1/2"), MVR 160 (2"), MVR 350 (3"), MVR 650 (4"), and MVR 1300(6").
- **SIZES** ..... 3/4", 1", 1-1/2", 2", 3", 4" and 6"
- **STANDARDS** ..... Manufactured and tested to meet or exceed all applicable parts of ANSI/AWWA C701 class I Standard.
- **SERVICE** ..... cold water measurement with flow in only one direction.
- **NORMAL OPERATING FLOW RANGE** ..... See charts on page3.4.
- **ACCURACY** ..... 100% ±1.5% of actual throughput. See charts on page 3.3.
- **LOW FLOW REGISTRATION** ..... See chart on page 3.4.
- **PRESSURE LOSS** ..... See charts on page 3.3.
- **MAXIMUM WORKING PRESSURE** ..... 150 PSI
- **TEMPERATURE RANGE** ..... 33F to 130F
- **MEASURING ELEMENT** ..... Rotor
- **REGISTER TYPE** ..... Straight reading, permanently sealed, magnetic drive with low flow indicator. Remote reading units optional.
- **REGISTRATION** ..... See chart on page 3.4.
- **CAPACITY** ..... See chart on page 3.4.
- **METER CONNECTIONS** ..... 3/4" and 1" external (NPSM) straight pipe threads, 1-1/2 size and 2" size available with either two bolt flanged ends or internal thread (NPT) ends same nominal size as size of meter, 3" thru 6" ANSI class 150 flanges.
- **MATERIALS** ..... Maincase - bronze ASTM B62; Rotor assembly - thermoplastic; Strainer - thermoplastic (std. in 3/4" thru 1-1/2"; stainless steel optional) or stainless steel (2" - 6"); Casing bolts - stainless steel ANSI B18.

Model MVR

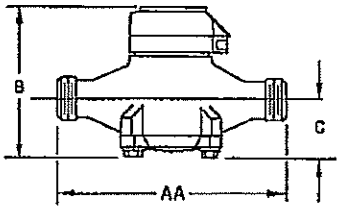
Hersey PRODUCTS

Magnetic Drive Vertical Turbine Meters
Sizes 3/4", 1", 1-1/2", 2", 3", 4" and 6"

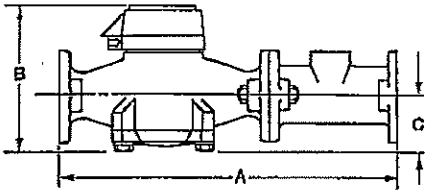
Dimensions and weights



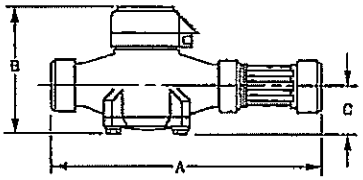
3/4" and 1" standard MVR



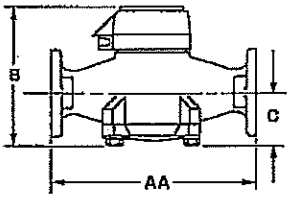
3/4" and 1" compact MVR



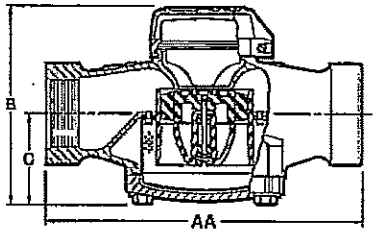
1-1/2" and 2" standard MVR with 2 bolt flange ends** and spool piece



1-1/2" and 2" standard MVR with Internal NPT ends

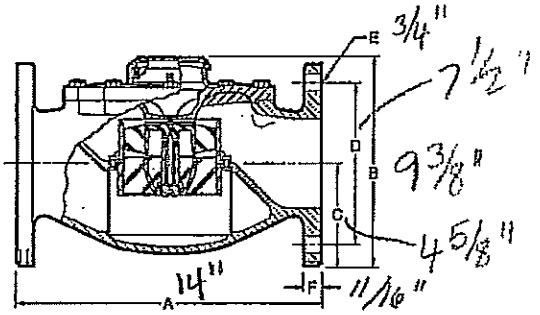


1-1/2" and 2" compact MVR with integral 2 bolt flange ends**



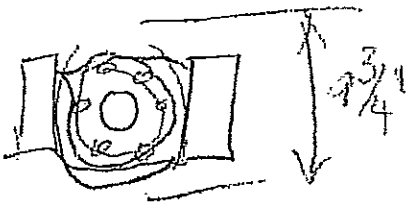
1-1/2" and 2" compact MVR with Internal NPT ends

NOTE: This cutaway view is typical of 3/4" - 2" MVR Meters.



3", 4" and 6" MVR

Meter Size	3/4"	1"	1-1/2"	2"	1-1/2"**	2"**	3"	4"	6"
Ends	Threaded (screwed)				Flanged				
Model	MVR30	MVR50	MVR100	MVR160	MVR100	MVR160	MVR350	MVR650	MVR1300
Dimensions									
A	9"	10-3/4"	12-5/8"	15-1/4"	13"	17"	12"	14"	18"
AA *	7-1/2"	9"	9"	10-1/2"	9"	10"	-	-	-
B	5"	5-1/2"	5-3/4"	6-1/4"	5-3/4"	6-1/4"	8-7/16"	9-3/8"	12-9/16"
C	1-13/16"	2-3/8"	2-3/8"	3"	2-3/8"	3"	3-7/8"	4-5/8"	6"
D	N/A	N/A	N/A	N/A	4"	4-1/2"	6"	7-1/2"	9-1/2"
E	N/A	N/A	N/A	N/A	5/8"	5/8"	3/4"	3/4"	7/8"
F	N/A	N/A	N/A	N/A	11/16"	15/16"	5/8"	11/16"	13/16"
Maximum width	3-3/4"	4-1/4"	4-3/8"	5-3/8"	5-3/8"	5-15/16"	7-7/8"	9-3/4"	12-7/8"



* Compact length
** 1-1/2" and 2" Flanged meters have 2 bolt oval flange pattern.

NOTE: Meter couplings are optional and must be ordered separately. Weights are in pounds and are approximate.

Hersey PRODUCTS

Mueller Co.
Decatur, IL 62525

For Further information, contact:
Hersey Customer Service
Cleveland, NC 27013
1-704-278-2221
1-800-323-8584 (In USA)

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ATTACHMENT H

Wastewater Construction Permit
Bureau of Water

DHEC
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

PROJECT NAME: FOREST HILLS S/D LIFT STATION	COUNTY: ANDERSON
LOCATION: OFF OF MELONIE DR. NEAR WILLIAMSON	

PERMISSION IS HEREBY GRANTED TO: JACABB UTILITIES INC
210 W N SECOND ST
SENECA SC 29678

for the construction of a sanitary sewer system in accordance with the construction plans, specifications, design calculations and the Construction Permit Application signed by Adam Hogan, Registered Professional Engineer, S.C. Registration Number: 25472.

PROJECT DESCRIPTION: 3422 lf of 4' force main, 279 lf of 8" gravity sewer line, 3 manholes, and a pump station to serve 80 lots.

TREATMENT FACILITY: The wastewater will be discharged to the WILLIAMSTON TOWN OF (NPDES permit SC0046841) at a design flow rate of 32000 gallons per day (GPD).

STANDARD CONDITION:

In accepting this permit, the owner agrees to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection. This is a permit for construction only and does not constitute DHEC approval, temporary or otherwise, to place the system in operation. An Approval to Place in Operation is required and can be obtained following the completion of construction by contacting the ANDERSON EQC OFFICE at 864-260-5569. Additional permits may be required prior to construction (e.g., Stormwater).

SPECIAL CONDITIONS:

None

PERMIT NUMBER:	**34395-WW**
ISSUANCE DATE:	**October 04, 2007**
EXPIRATION DATES:	**October 03, 2009** (to begin construction) **October 04, 2010** (to obtain Approval to Place in Operation)

Ann R. Clark

Ann R. Clark, Director
Stormwater, Construction and Agricultural
Permitting Division

RJR

Received Time Oct. 4. 1:00PM

ATTACHMENT I

GOLDIE & ASSOCIATES
engineering, environmental and laboratory services

January 8, 2008

Mr. Wayne Stokes
SCDHEC-Bureau of Water
Water Facilities Permitting Division
2600 Bull Street
Columbia, SC 29201

Re: Forest Hills Subdivision Lift Station
Previous Wastewater Permit Number: 34395-WW
Goldie and Associates Project #1001.11.5

Dear Mr. Stokes:

Enclosed, please find a revised sewer submittal for the above referenced and previously permitted project. The submittal includes:

- Original and three copies of the revised permit application
- Three sets of revised sewer plans
- One overall plan sheet showing existing and proposed sewer
- Three sets of revised calculations

It is our understanding that original acceptance letters, location map, and the application fee are still applicable to these revised plans.

This revision involves moving the pump station to the other side of the existing lagoon, thus eliminating much of the gravity sewer and shortening the forcemain.

If you have any questions or need any further information to finalize your review of this project, please contact me at 864-882-8194, ext. 123.

Sincerely,
Goldie and Associates

Adam Hogan

Adam Hogan, P.E.
Project Engineer

Encl.: As stated.

210 W. North Second Street • Seneca, South Carolina 29678 • Phone (864) 882-8194 • Fax (864) 882-0851

XII. **Type of Submittal:** Complete Section A (Standard) *or* Section B (Delegated Review Program - DRP).

A) Standard Submittal *must* include the following, where applicable:

- ☑ 1. A transmittal letter outlining the submittal package.
- ☑ 2. The original construction permit application, properly completed, with three (3) copies.
- ☑ 3. Three (3) sets of signed and sealed plans and specifications. Specifications may be omitted if approved standard specifications are on file with DHEC. Six (6) sets required for a combined submittal if a WWTF is included.
- ☑ 4. One (1) additional overall plan sheet showing the proposed and existing (only in the area of proposed construction) water and wastewater lines (highlighted for identification) and their sizes.
- ☑ 5. Three (3) sets of the appropriate design calculations. WASTEWATER: Design flow (based on R.61-67, Appendix A), pump station calc's. and pump curve. WATER: Recent flow test from a location near the tie-on site, design calc's. indicating pressure maintained in the distribution system during max. instantaneous demand, fire flow and flushing velocities achieved. Number/types of service connections, well record form, pumping test results, etc.
- ☑ 6. Three (3) copies of a detailed 8½" x 11" location map, separate from the plans.
- ☐ 7. Three (3) copies of construction easements unless the project owner has the right of eminent domain.
- ☑ 8. A letter(s) from the entity supplying water and/or providing wastewater treatment stating their willingness and ability to serve the project, including pretreatment permits, if applicable. The letter should include the specific flow and, when applicable, the specific number of lots being served.
- ☑ 9. A letter(s) from the entity agreeing to be responsible for the operation and maintenance (O&M) of the systems.
- ☑ 10. Application fee enclosed $ 350.00 . (Refer to Instructions).
- ☐ 11. WATER SYSTEMS: a) A letter from the local government which has potable water planning authority over the area, if applicable, in which the project is located, stating project consistency with water supply service plan for area.
  b) For wells, four (4) copies of a wellhead protection area inventory.
  c) For new wells, a viability demonstration is required in accordance with Regulation 61-58.1.B.(4).

Note: Other approvals may include 208 and OCRM certification, and navigable waterway permitting.

B) DRP submittal (treatment plants are not covered) *must* include the following, where applicable:

- ☐ 1. A transmittal letter, signed by the professional engineer representing the DRP entity, noting this is a DRP submittal. The letter should state that the project has been reviewed and complies with R.61-58 and/or R.61-67.
- ☐ 2. The original construction permit application, properly completed, with two (2) copies.
- ☐ 3. Two (2) sets of the signed and sealed plans.
- ☐ 4. One (1) additional plan sheet with water and wastewater lines highlighted, as required under Sec. XII.A.4. above.
- ☐ 5. Two (2) sets of the appropriate design calculations. WASTEWATER: Same information as required under Section XII.A.5. above. WATER: Same information as required under Section XII.A.5. above.
- ☐ 6. Two (2) copies of a detailed 8½" x 11" location map, separate from the plans.
- ☐ 7. Two (2) copies of construction easements, unless the project owner has the right of eminent domain.
- ☐ 8. DHEC's Ocean and Coastal Resource Management certification (for projects in applicable counties).
- ☐ 9. DHEC's Water Quality permit or conditions for placement in navigable waters, and other Agency approvals.
- ☐ 10. WASTEWATER SYSTEMS: a) A letter of acceptance from the entity providing the treatment of the wastewater that includes the specific flow and, when applicable, the specific number of lots being accepted.
  b) A letter from the organization agreeing to be responsible for the O&M of the sewer system.
  c) The 208 Plan certification from the appropriate Council of Governments (designated 208 areas), or from DHEC on the non-designated 208 areas.
- ☐ 11. WATER SYSTEMS: A letter from the local government which has potable water planning authority over the area, if applicable, in which the project is located, stating project consistency with water supply service plan for area.
- ☐ 12. Fee of $75 for water and $75 for sewer ($150 if combined).

Note: The DRP entity should ensure that a copy of the final approved plans are returned to the design engineer.

XIII. Construction plans, material and construction specifications, the engineering report including supporting design data and calculations are herewith submitted and made a part of this application. I have placed my signature and seal on the engineering documents submitted, signifying that I accept responsibility for the design of this system, and that I have submitted a complete administrative package.

Engineer's Name (Printed): Adam Hogan, P.E. Signature: Adam Hogan

S.C. Registration Number: 25472 Registered Professional Engineer

XIV. Prior to final approval, I will submit a statement certifying that construction is complete and in accordance with the approved plans and specifications, to the best of my knowledge, information and belief. This certification will be based upon periodic observations of construction and a final inspection for design compliance by me or a representative of this office who is under my supervision.

Engineer's Name (Printed): Adam Hogan, P.E. Signature: Adam Hogan

S.C. Registration Number: 25472 Registered Professional Engineer

XV. I hereby make application for a permit to construct the project as described above. I have read this application and agree to the requirements and conditions and agree to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection.

Owner's Name (Printed): Steve Goldie Signature:

Owner's Title: Managing Owner Date: 1/28/08

#1001, 11.5

MEMORANDUM

TO: Wayne Stokes
Water Facilities Permitting

FROM: Christian Bentley
DATE: 06/11/07

SUBJECT: Appalachian Regional Water Management Plan Conformance Review

Please be advised that the Appalachian Council of Governments has reviewed the following project for conformance with the Appalachian Regional Water Quality Management and has considered the anti-degradation provisions of Section D of Regulation R. 61-68. The conformance status and any conditions of approval are indicated below:

Project Name:	Forest Hills S/D Lift Station
NPDES Permit:	
County:	Anderson
Project Location:	Melonei Dr, Williamston
Basin:	Saluda River Basin
Description:	Gravity Sewer
Type of Review:	Construction Permit
Type of Waste:	Domestic
Existing Volume:	.000000 mgd Proposed Volume: .032000mgd
Disposal Method:	Big Creek WWTP (SC0046841)
Receiving Waters:	Saluda River
Engineering Firm:	Goldie & Associates, Inc.
Project Engineer:	Adam Hogan Phone: 8648828194
DHEC/DRP Contact:	Wayne Stokes Phone: 8038984300
Date Received:	05/24/07
Date Reviewed:	06/11/07
Reviewed By:	Bentley
Conformance Status:	Approved
Conditions:	

CERTIFYING OFFICIAL: Christian H. Bentley DATE: 06/20/07

30 Century Circle . PO Drawer 6668 . Greenville, SC 29606
864.242.9733 . Fax 864.242.6957 . www.scacog.org

Forest Hills Subdivision Sewer Lift Station

Unit Contributory Loading - Current

Gravity Sewer Loading

Average Daily Flow per Residence = 400 GPD

Number of Residences = 35

ADF = 14,000 GPD

ADF = 9.7 gpm (based on 24 hr/day)

Peaking Factor = 2.5

PDF = 24.3 gpm

Gravity Sewer Capacity

Gravity Sewer Diameter, d = 8 in

Manning's Coefficient, *n* = 0.013 *(for PVC sewerline)*

Gravity Sewer XS-Area, A = 0.35 ft^2

Hydraulic Radius, R = 0.2 in

Min. Gravity Slope, S = 0.005 ft/ft

Full-Flow Capacity, Q = 0.86 cfs

Full-Flow Capacity, Q = 384.6 gpm

∴ Gravity sewer capacity is adequate.

Pump Station Design Flow

- **Peak Loading**

From unit contributory loading above,

PDF = 24.3 gpm

- **Required Flushing Flow**

Required Flushing Velocity, v = 2.00 fps

Forcemain Diameter, d = 4 in *(for 4" PVC)*

Forcemain XS-Area, A = 0.09 ft^2

$$Q = V * A$$

Required Flushing Flow = 0.17 cfs

Required Flushing Flow = 78.3 gpm

∴ Use pumping rate of 100 gpm.

Forest Hills Subdivision Sewer Lift Station

Pump Station System Curve (4" PVC Forcemain)

Static Head

High Point Elevation = 282.00 ft *(epp, discharge elevation - high point)*
Low Point Elevation = 186.07 ft *(epp, lift station pump off - low point)*

Static Head Loss = High Point Elevation - Low Point Elevation

Friction Head

Actual Pipe Length = 3,102 ft
Pipe Diameter = 4.0 in

Minor Losses: 5 - 90° Bends, 12 - 15° Bends

	KL	# Bends	∑KL
90° Bend	0.8	4	3.2
		∑KL =	3.2

Minor Loss Resistance Coefficient = KM = $\sum KL / 2gA^2$ = 0.0040

where KL = minor loss coefficient
g = acceleration due to gravity (32.2 ft/s)
A = cross sectional area of the pipe ($\pi d^2/4$)

Head Loss Due to Minor Losses = KM*(0.002228*Q)^2

where KM = minor loss resistance coefficient
Q = flow (gpm)

Hazen and Williams Friction Factor Equation

$$f = 0.2083 * \left(\frac{100}{C}\right)^{1.85} * \frac{Q^{1.85}}{d^{4.8655}}$$

where C = roughness factor (= 130 for D.I.P.)
d = inside diameter in inches
Q = flow in gpm

Eq. Length = 1.0 * Actual Pipe Length

Friction Head Loss = f * (L / 100)

Total Head = Static Head Loss + Friction Head Loss

HOMA
PUMPEN MIT SYSTEM

Technical Information

GRP79/1

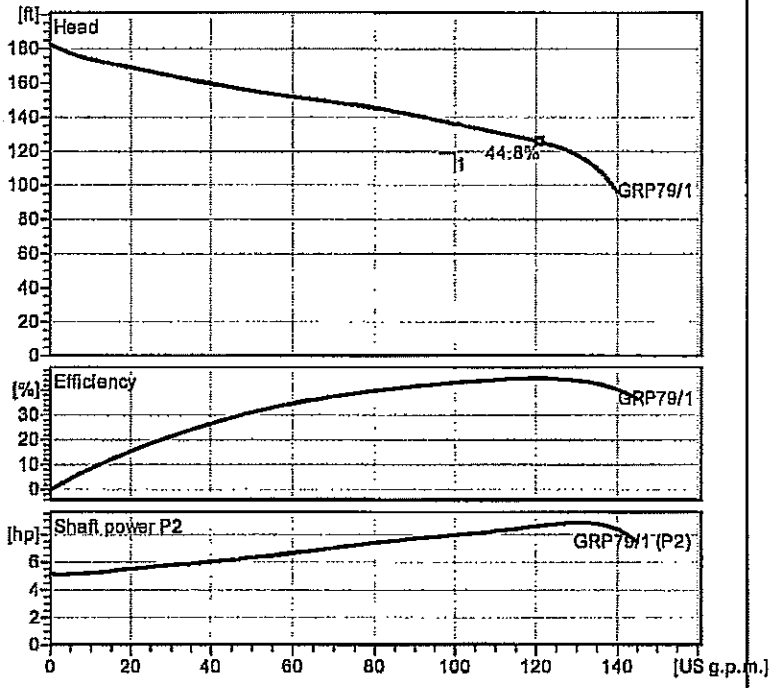
Operating data	
Flow	100 US g.p.m.
Head	119 ft
Pump efficiency	43.7%
Required power	8.11 hp
NPSH	
Fluid	Water, clean
Temperature	68 °F
Pumpe type	Single head pump
No. of pumps	1

Pump data	
Type	GRP79/1
Manufacturer	HOMA
Series	GRP (FM)
Impeller	vane impeller with cutter sys.
Impeller size	6 11/16"
Solid size	
Discharge port	2" ANSI

Motor data	
Rated voltage	230 V
Frequency	60 Hz
Power output (P2)	12.6 hp
Rated speed	3450 rpm
Number of poles	2
Efficiency	88 %
Rated current	44.8 A
Degree of protection	IP 68

Materials	
Motor housing	Grey cast iron GG25
Pump housing	Grey cast iron GG25
Impeller	Grey cast iron GG25
Cutting system	Stainless steel 1.4122
Motor shaft	Stainless steel 1.4104
Bolts	Stainless steel
Elastomeres	Nitrile Rubber
Motor jacket	Stainless steel
Mechanical seal on medium side	SIC / SIC
Mechanical seal on motor side	SIC / SIC
Upper Bearing	Deep Groove Ball Bearing
Lower Bearing	Double row angular ball bearing

Testnorm
ISO 9906



Wet well installation with auto coupling system

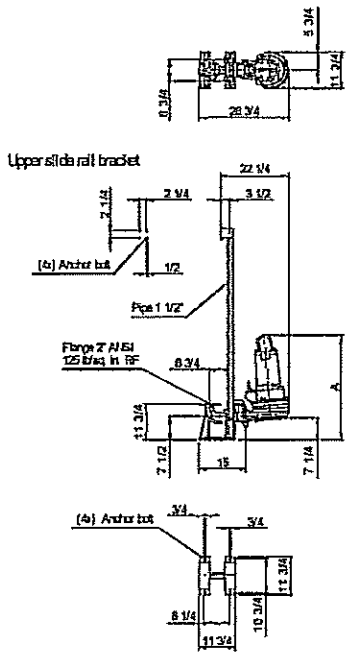


Table Dimensions (inch)

Dimensions in mm, letters see table

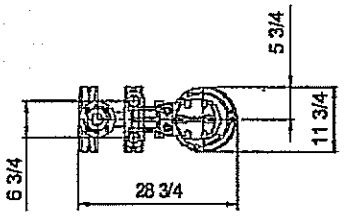
2.0 - 21.02.2006 (Build 105)

Project	Project no.:	Created by:	Page: 1	Date: 2008-01-09

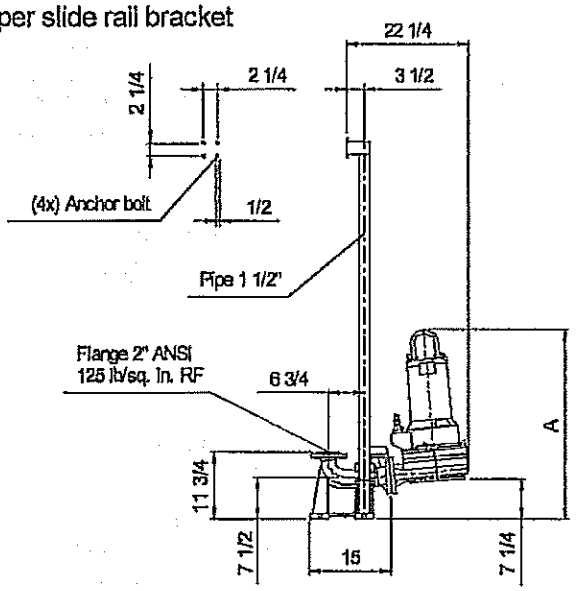
Dimensions

GRP79/1

Wet well installation with auto coupling system
Dimensions in mm, letters see table



Upper slide rail bracket



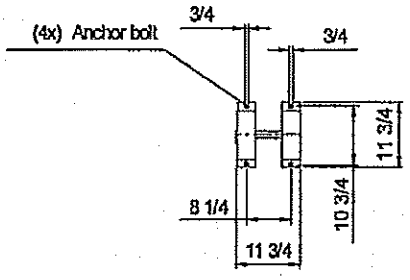


Table Dimensions (inch)

2.0 - 21.02.2006 (Build 105)

Project	Project no.:	Created by:	Page: 3	Date: 2008-01-09

Forest Hills Subdivision Sewer Lift Station

Pump Station Cycle Time Calculations - Current

Based on the pump curve, the pump will operate at

100 gpm @ 119 ft TDH

The pump is a HOMA Grinder Pump Model GRP79/1, 2", 10 Hp w/impeller 8-11/16".

Wet Well Volume

Wet Well Diameter = 4 ft

$$V = \frac{\pi}{4} * d^2 * 1\frac{ft}{ft} * 7.48\frac{gal}{ft^3}$$

V = 94.0 gal/ft

Run Time & Detention Time

- Try 1'-6" of storage between "Pump Off" & "Lead On" floats.

Depth of Storage Provided = 1.50 ft

Storage Volume Provided = 141.0 gal

t_{fill} = 14.50 min *(based on ADF In)*

- Use the 100 gpm pump rate.

Q_{empty} = 100 gpm

Q_{fill} = 10 gpm *(based on ADF)*

$$t_{empty} = \frac{V}{Q_{empty} - Q_{fill}}$$

t_{empty} = 1.56 min

Run Time & Detention Time

	14.50	minutes	- detention time
+	1.56	minutes	- pump run time
	16.06	minutes	- cycle time

∴ 3.74 cycles/hr

Wastewater Construction Permit
Bureau of Water

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

PROJECT NAME: **FOREST HILLS S/D LIFT STATION**	COUNTY: **ANDERSON**
LOCATION: OFF OF MELONIE DR. NEAR WILLIAMSON	

***REVISED: JANUARY 16, 2008**

PERMISSION IS HEREBY GRANTED TO: JACABB UTILITIES INC
210 W N SECOND ST
SENECA SC 29678

for the construction of a sanitary sewer system in accordance with the construction plans, specifications, design calculations and the Construction Permit Application signed by Adam Hogan, Registered Professional Engineer, S.C. Registration Number: 25472.

PROJECT DESCRIPTION: Installation of approximately 3,102 LF of 4" PVC force main, 12 LF of 8" PVC gravity sewer main, one (1) sewer manhole, one (1) sewer lift station and all necessary appurtenances to serve 80 lots.

TREATMENT FACILITY: The wastewater will be discharged to the WILLIAMSTON TOWN OF (NPDES permit SC0046841) at a design flow rate of 32,000 gallons per day (GPD).

STANDARD CONDITION:

In accepting this permit, the owner agrees to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection. This is a permit for construction only and does not constitute DHEC approval, temporary or otherwise, to place the system in operation. An Approval to Place in Operation is required and can be obtained following the completion of construction by contacting the ANDERSON EQC OFFICE at 864-260-5569. Additional permits may be required prior to construction (e.g., Stormwater).

SPECIAL CONDITIONS:

None

PERMIT NUMBER:	**34395-WW**
ISSUANCE DATE:	**October 04, 2007**
EXPIRATION DATES:	**October 03, 2009** (to begin construction) **October 04, 2010** (to obtain Approval to Place in Operation)

David C. Price, P.E., Assistant to Director
Water Facilities Permitting Division

RJR (DPJ)

***THIS PERMIT HAS BEEN REVISED TO REFLECT A SUBTRACTION OF 320 LF OF 4" FORCE MAIN, 267 LF OF 8" GRAVITY SEWER MAIN, AND TWO (2) SEWER MANHOLES.**